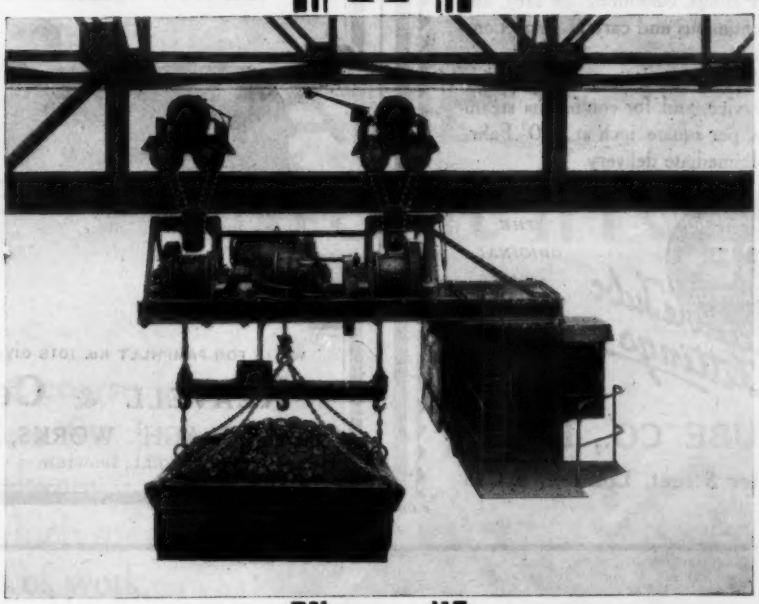
GAS JOURNAL

LIGHT . HEAT . POWER . BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 204. 85th Year. LONDON, NOVEMBER 29, 1933. No. 3680. Price 1s.

ELECTRIC ALL TYPES **TELPHERS** ALL CAPACITIES



For Direct or Remote Control

For handling Coal, Coke, Oxide, etc., by means of Skips or Grabs.

The illustration shows a 7-Ton Gross Load, three barrel machine for handling coke from Intermittent Vertical Retorts.

STRACHAN WHITEHALL **&** **HENSHAW** BRISTOL **LTD.**

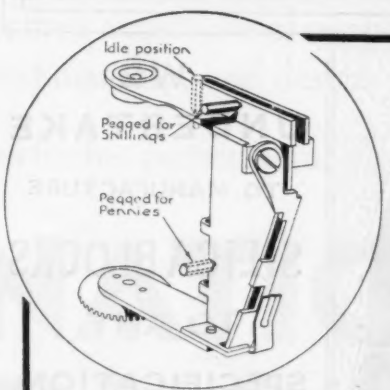


Illustration shows the coin pocket of a "Chelsea Two" Meter which normally takes both pennies and shillings. Note the simple screw peg which enables the Meter to be restricted to take pennies only or shillings only.

The Gas Meter which takes PENNIES *and* SHILLINGS

and can be easily restricted to take

PENNIES ONLY OR SHILLINGS ONLY

GEORGE GLOVER'S

"CHELSEA TWO"

GEORGE GLOVER & CO., LTD.

Dry Meter Manufacturers and Repairers

RANELAGH WORKS, Chelsea, London, S.W. 3

'Phone: Sloane 7257-7258. Wires: "Dry Meters, Phone, London."

Branches: Ranelagh Meter Works, East Park View, LEEDS. City Meter Works, Port Street, MANCHESTER

Why you cannot afford NOT to use +GF+ Fittings

Inspection plays an important part in the production of +GF+ malleable iron pipe fittings. After every process which is likely to cover up a surface defect every fitting is sand-blasted and rumbled till its surfaces are bright and shining and trained eyes can then detect the slightest fault.

That is why +GF+ Fittings, combining, as they do, real malleability with continuous and careful inspections and tests during manufacture, are certain to give complete satisfaction on all your pipe lines, whether for gas, water, oil, or air service, and for continuous steam pressure up to 225 lbs. per square inch at 650° Fahr. 8,500 sizes, ⅛"—6". Immediate delivery.

Ask for Catalogue and terms

EVERY FITTING +GF+ GUARANTEED Malleable Tube Fittings

THE ORIGINAL SWISS FITTINGS

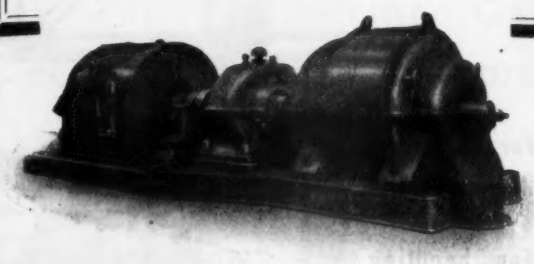
LE BAS TUBE CO., LTD.,
Dock House, Billiter Street, London, E.C. 3

E.J.H.

TURBO-COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.

* * *

We build a complete range of Compressors & Exhausters for air and GAS, suitable for all purposes connected with the Gas Industry, including Turbo-Compressors for large capacities, as illustrated below.



WRITE FOR PAMPHLET No. 101B GIVING PARTICULARS:—

REAVELL & CO., LTD.,
RANELAGH WORKS, IPSWICH.

TELEGRAMS: REAVELL, IPSWICH. TELEPHONE: 2124 & 5

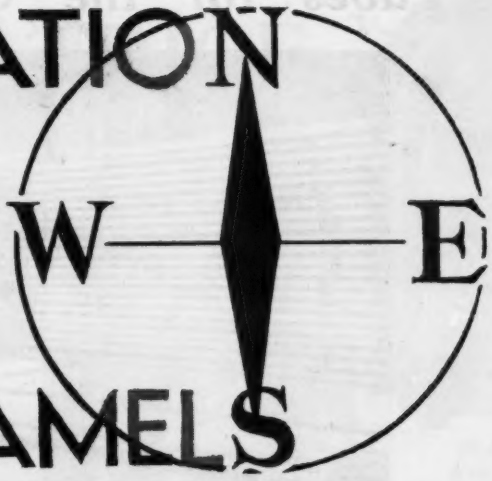
SILICA RETORTS.

MINIMUM EXPANSION
The Oughtibridge Silica Firebrick Co., Ltd.
Oughtibridge, Near Sheffield.
Estd 1858.

WE UNDERTAKE TO MANUFACTURE SILICA BLOCKS TO ANY SPECIFICATION REQUIRED.

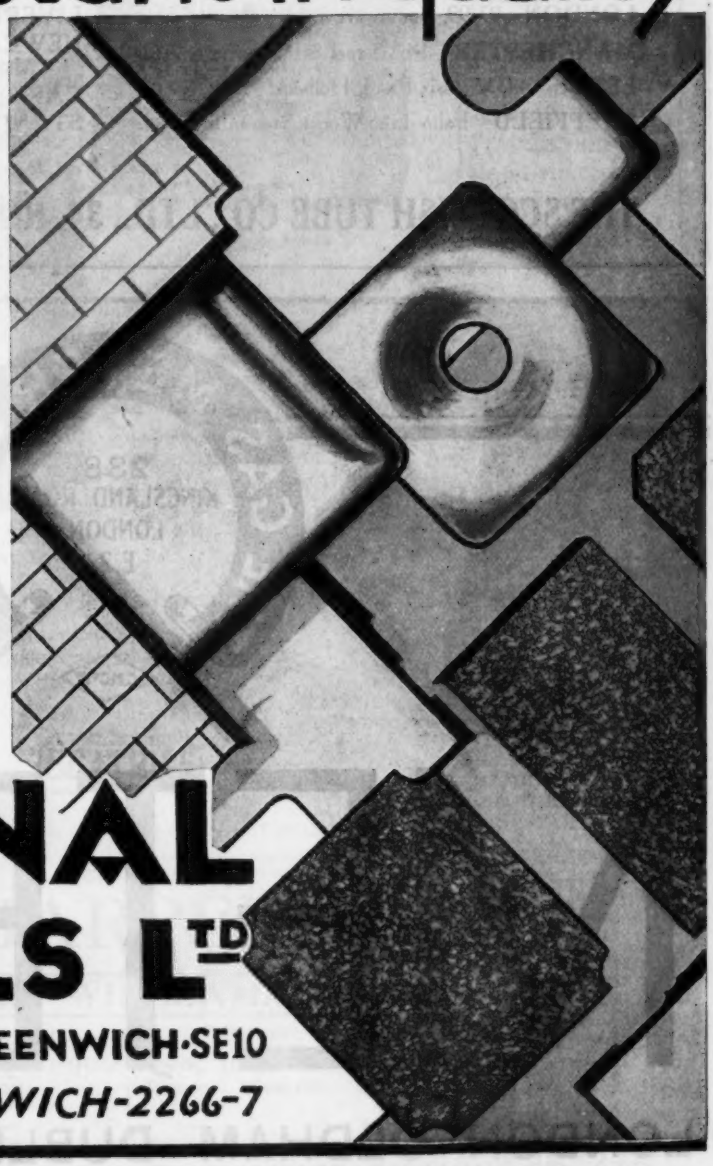
COKE OVEN BLOCKS.

NO VARIATION



IN OUR ENAMELS

— constant in quality



Pursue the safest course and place your orders for heat-resisting enamelware with an undertaking which specializes in this class of work.

"Constancy" is our watchword, and our linings, trays, and splash plates are noted for their excellence of quality, workmanship, and design.

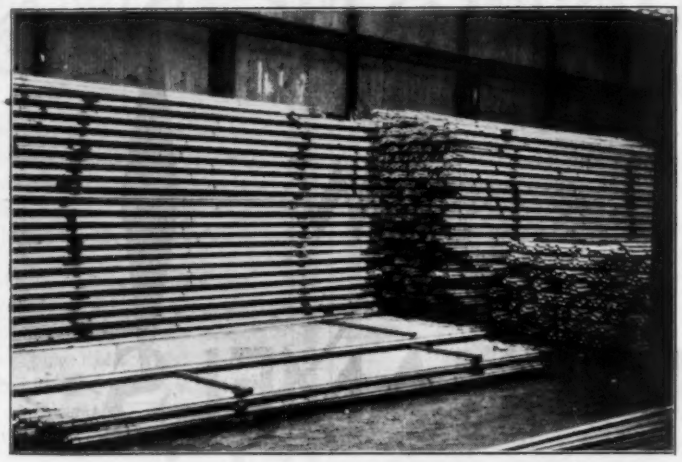
For further particulars apply—

NATIONAL ENAMELS LTD

53 NORMAN ROAD·GREENWICH·SE10

TELEPHONE—GREENWICH-2266-7

Tubes for the Gas Industry



Our Warehouses can supply you with them promptly.

LONDON—97/99, Southwark Bridge Road, S.E.1.
MANCHESTER—14, Chapel St., Victoria Bridge.
LEEDS—44, Victoria Road, Holbeck.
SHEFFIELD—Palm Tree Works, Staniforth Road.
LIVERPOOL—Duke's Dock.
NEWCASTLE-UPON-TYNE—Railway Arches, Manors Station.
CARDIFF—Collingdon Road, Bute Docks.
ST. AUSTELL—West Bridge.

or write direct to

THE SCOTTISH TUBE CO., LTD., 34, ROBERTSON ST., GLASGOW

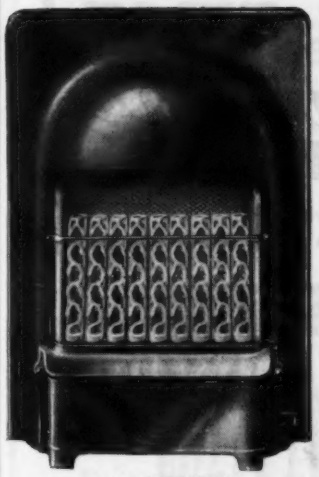
THE GAS METER COMPY Ltd
238, KINGSLAND ROAD, LONDON, E.2.
G.M.C.ºL

METERS

LONDON - OLDHAM - DUBLIN - MANCHESTER

"BEATRICE"
GAS FIRES

A DESIGN TO MEET EVERY REQUIREMENT



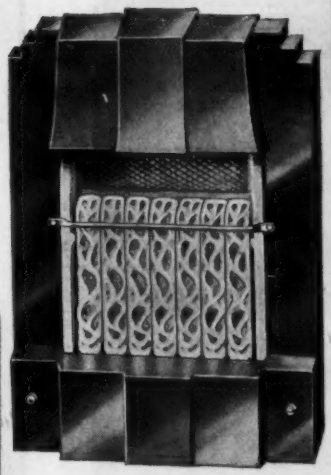
"BEATRICE"
5, 7 or 9 Radiant
(Square Top).

FITTED WITH TRIPLE DISINTEGRATING INJECTORS GIVING COMPLETE INCANDESCENCE AT MODERATE GAS PRESSURES.

"BEATRICE"
5 or 7 Radiant
(Round Top).

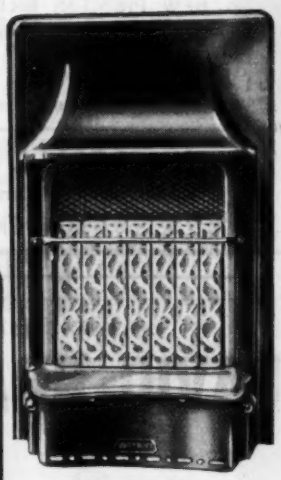
FINISHES

ART BLACK VITREOUS ENAMELS AND CHINESE LACQUERS IN A WIDE VARIETY OF COLOURS.



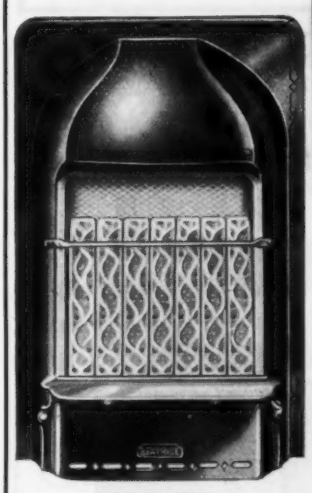
"MARION"
7 Radiant.

ALL FIRES FINISHED WITH CHINESE LACQUER ARE SUPPLIED WITH NICKEL PLATED FENDERS, THE PRICES BEING THE SAME AS FOR ART BLACK FIRES.



"VICEROY"
7 or 9 Radiant.

ALL FIRES ARE SUPPLIED WITH "BEATRICE" SUNGLOW RADIANTS HAVING ALL THE CONSTITUENTS FOR HEALTHY EFFICIENT HEAT.



"ALBION"
7 Radiant.

"ROZELLE"
7 Radiant.

PEDESTAL AND SWING BOILING BURNERS CAN BE SUPPLIED AS REQUIRED.

REG'D TRADE MARK No 224,159
BEATRICE
MADE IN ENGLAND

SILENT IN LIGHTING, BURNING AND EXTINGUISHING.

MANUFACTURERS:

JOHN HARPER & CO. LTD.

ALBION WORKS, WILLENHALL, STAFFS.

Telephone: Willenhall 124 (4 lines). Telegrams: Harpers, Willenhall

London Office: ATLANTIC HOUSE, 45/49, HOLBORN VIADUCT, E.C.1
Telephone: Holborn 5154 Telegrams: Oilgas, Cent., London

Provincial Selling Agents in Great Britain and Ireland for Gas Fires, Radiators, and Cookers manufactured by John Harper & Co., Ltd.

ECONOMIC GAS BOILER CO., LTD.
Junction Mills, Burnley
Telephone: 3305 Burnley Telegrams: Bluboilers Burnley

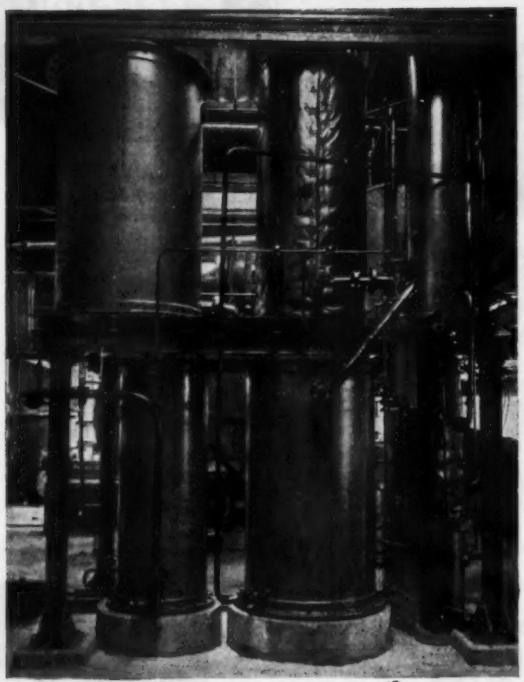
Sole Agents for London and district—

LIGHTING TRADES LTD., and WELSBACH LIGHT CO., LTD.
51/55, Garratt Lane, Wandsworth, London, S.W.18
Telephone: Battersea 6008 Telegrams: Litetrades, 'Phone, London

Benzole Recovery Plant

for

Large and Small Gas Works.



Recent installation at Chester Gas Works.

Wilton's Static Washer-Scrubber. The first and best. 25 Installations.

The Highest product without loss in the naphthalene fraction. Full Value of heat exchange. Automatic. Compact. In standard sizes.

ALL BRITISH

Full particulars, and enquiries to :—

THE CHEMICAL ENGINEERING & WILTON'S PATENT FURNACE Co., Ltd.

76, VICTORIA STREET, LONDON, S.W.

TELEGRAMS: "EVAPORATOR, PHONE, LONDON." TELEPHONE: VICTORIA 2417

Wilton

GET IT FIRST!

"Supastone"

THREE-PLY GLASS

with a

Glassware— Best Czecho-Slovakian make

NEW FEATURE

UNIVERSAL SIZE, TINTED PINK, GREEN, CHAMPAGNE or BLUE

No. G2742

Also Supplied Plain White for Universal, Medium, or Bijou Fitting

TINTED GAS SHADES

A NEW PROCESS ENTIRELY ELIMINATING THAT COLD WHITE LIGHT USUALLY ASSOCIATED WITH WHITE OPALINE GAS SHADES WITHOUT LOSS OF EFFICIENCY.

LIST No. G273 Gas Fittings, etc., gladly sent free on request.

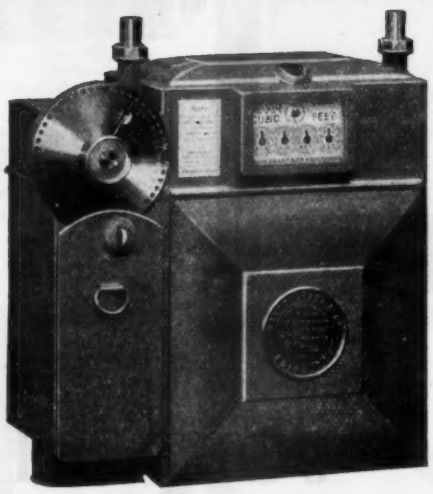
THE WHOLESALE FITTINGS Co., Ltd.

23-27 & 37, Commercial Street,

MANCHESTER, 4— 78-80, High Street. LONDON, E. 1 BRISTOL, 1— 83, Victoria Street.

ESTABLISHED 1855.

DAVID GRANT & CO.



WET and DRY GAS METERS,

STANDARD and HIGH CAPACITY METERS

STATION METERS, PRESSURE GAUGES, SYPHON PUMPS.

SLOT METERS Simple, Strong, Compact, Accurate.

1d. or 1s. or Two Coin.

EAST CROSSCAUSEWAY, EDINBURGH.

Telegrams: "Dagran Edinburgh." Telephone: Edinburgh 41574.

One of the life-size displays designed for showroom or window use in conjunction with actual standard models of the

RADIANT PANEL GAS HEATER

½ and ¼ size Displays, complete with true-to-scale working model heaters, are also available. These make interesting Counter Shows, and provide a point of contact with all showroom visitors.

May we Co-operate with you?

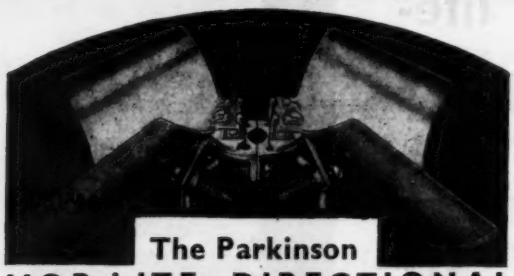
THESE displays enable you to link up with the NEATER HEATING Press Advertising (in which Miss Radiant Panel is starring). Papers used include "Daily Mail," "Sunday Express," "Punch," "Tatler," "Good Housekeeping," "Ideal Home," "Country Life," "Homes and Gardens," etc. We would also be pleased to co-operate with you by advertising in your local newspaper on a mutually agreeable basis. May we submit suggestions for approval?

SIDNEY FLAVEL & Co. Ltd., Stovemakers since 1777 LEAMINGTON

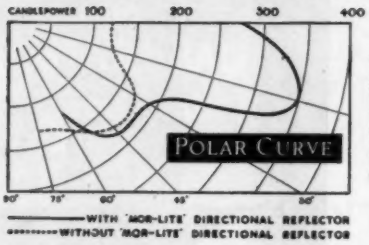
When in London call and see the heaters working at THE WELBECK STREET FIREPLACE GALLERIES, a permanent exhibition consisting of eight galleries devoted to Fireplaces and Stoves specially selected for people of discernment. You are cordially invited to inspect 38, WELBECK STREET, LONDON, W.1.

DOES 100% INCREASE IN ILLUMINATION APPEAL TO YOU?

TYPE G LANTERN WITHOUT MOR-LITE REFLECTOR



The Parkinson
MOR-LITE DIRECTIONAL REFLECTOR FOR GAS LIGHTING



The curve shows the Directional Increase in Illumination at no extra cost for Gas

TYPE G LANTERN WITH MOR-LITE REFLECTOR

1. THE "MOR-LITE" DIRECTIONAL REFLECTOR increases the candle power by reflection at low angles where light is most needed.
2. Using a Twin Burner with No.2 medium mantle there is a directional increase from normal 150 c.p. to over 350 c.p. in illumination.
3. Can be fitted in a moment. Can be instantly adjusted both vertically and horizontally to give maximum light service.
4. Wing reflectors can be adjusted by wing nuts to meet every need.
5. Wings lift off instantly for Lamp Cleaning and are replaced without disturbing adjustments.

Send for sample and price list.

W. PARKINSON & CO., BIRMINGHAM · LONDON & BELFAST

INCORPORATED IN PARKINSON & COWAN (GAS METERS) LTD.

FIREBRICKS *and* RETORTS *with a* CENTURY *of* EXPERIENCE *behind them*

"GLENBOIG" BRICKS DO NOT SPALL

Nearly a century has passed since the first batch of "GLENBOIG" Firebricks was dispatched.

Year after year the demand for "GLENBOIG" refractories has increased until to-day they are known and used practically all over the world.

The reason for their continued popularity is quality—quality which means to the user economy and efficiency in his own particular business.

Hundreds of unsought testimonials have been received.

60 PRIZE MEDALS HAVE BEEN AWARDED.

Sole Proprietors and Manufacturers:

THE GLENBOIG UNION FIRECLAY CO., LTD.

Head Office:
48, West Regent Street, Glasgow, C. 2.
'Phone: Douglas 3009 & 2120.
Telegrams: "Glenboig," Glasgow.

London Office:
Abford House, Wilton Road, Westminster, S.W. 1.
'Phone: Victoria 0932.
Telegrams: "Superunits," London.

GLENBOIG BRICKS

Surrounds—for Modern Fires and Modern Homes

A fine range available of attractive patterns in artistic designs.

A wide range of Art-Metal Finishes to suit every decorative scheme.

Sincere craftsmanship in construction and finest quality materials.

Simplicity of fixing. Patterns adjustable to suit all mantel openings.

F. TURNER (ART-METAL) LIMITED
61-63, SUMMER HILL ST.
BIRMINGHAM, 1
'PHONE - CENTRAL 0704
'GRAMS - "ARTISTIQUE, PHONE, BIRMINGHAM."

THE NO-TROUBLE BURNER

THE 790 DS. BURNER is fitted with the BRAY SILENT REGULATOR and the BRAY PATENTED DIFFUSER. This combination is the most important advance in incandescent burner design for many years: IT BANISHES NOISE.

THE BRAY 790 DS BURNER.

THE IDEAL BURNER FOR MAINTENANCE WORK

GEO. BRAY & CO. LTD. LEEDS.

Specialists in—

GAS WORKS REFRACTORIES

GIBBONS have maintained their position as the leading suppliers of Gas Retorts and Refractories, by constant attention to the varying needs of Engineers and by supplying only reliable and thoroughly tested Products.

Before deciding on renewals or new plant let us give you the benefit of our many years' experience.

The Products that give SERVICE

We would call your attention to our

78% Siliceous material, Retorts, Blocks and Shapes,

and to our

95% Silica Segments and Blocks and Shapes

for

Horizontal and Vertical Gas Installations

and

COKE OVEN PLANTS

GIBBONS (DUDLEY) LTD

Head Office:
DIBDALE WORKS, DUDLEY, Worcs.
Phone: Dudley 3141
Telegrams: "Machine, Lower Gornal"

London Office:
151/4, PALACE CHAMBERS, S.W.1
Phone: Whitehall 6417
(Adjacent Westminster Tube Station)

BENZOLE RECOVERY

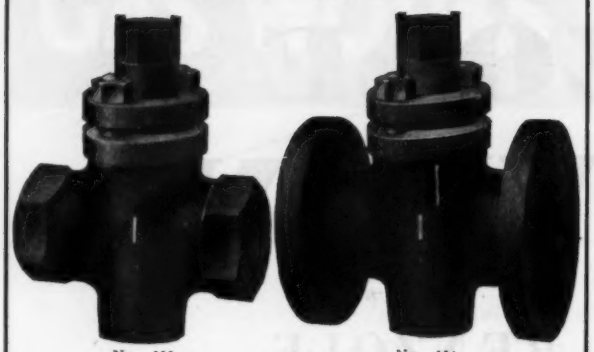
NATIONAL BENZOLE COMPANY, LTD.,—the largest Benzole distributing organisation in England—owned and controlled by British Benzole producers.

Write for particulars and terms of Membership to—

NATIONAL BENZOLE CO., LTD.,
WELLINGTON HOUSE . BUCKINGHAM GATE
LONDON S.W.1

Use National Benzole Mixture in your car and support home industries

HAUGHTON'S
HEAVY TYPE
CAST IRON
GLAND COCKS



No.—113 FOR No.—114

STEAM, WATER, GAS,
AMMONIACAL LIQUOR,
TAR, AND CHEMICALS

ALL SIZES IN STOCK

HAUGHTON'S PATENT METALLIC PACKING Co. Ld.
30, ST. MARY-AT-HILL, LONDON, E.C.3
PHONE - ROYAL 1383

Buildings of every Type for the Gas Industry

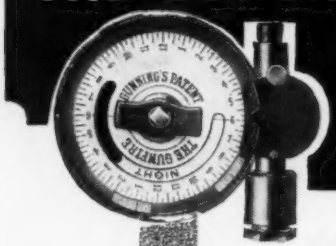
Horizontal Retorts
Gasholder Tanks
Railway Sidings
Pile Driving
Foundation Work
Breaker Pits
Hoppers
Bunkers
Retort Houses
Coal Stores
Gantries
Water Towers
Purifier Houses
Chimneys
Retaining Walls
Reservoirs

We specialise in construction and welcome your inquiries at any time for any of the plant mentioned.

THOS. VALE & SONS, LTD.
ESTD. 1869.
STOURPORT, WORCS.

REINFORCED CONCRETE STRUCTURES

THE CONTROLLER FOR AUTOMATIC LIGHTING
"GUNFIRE"
(TRADE MARK)



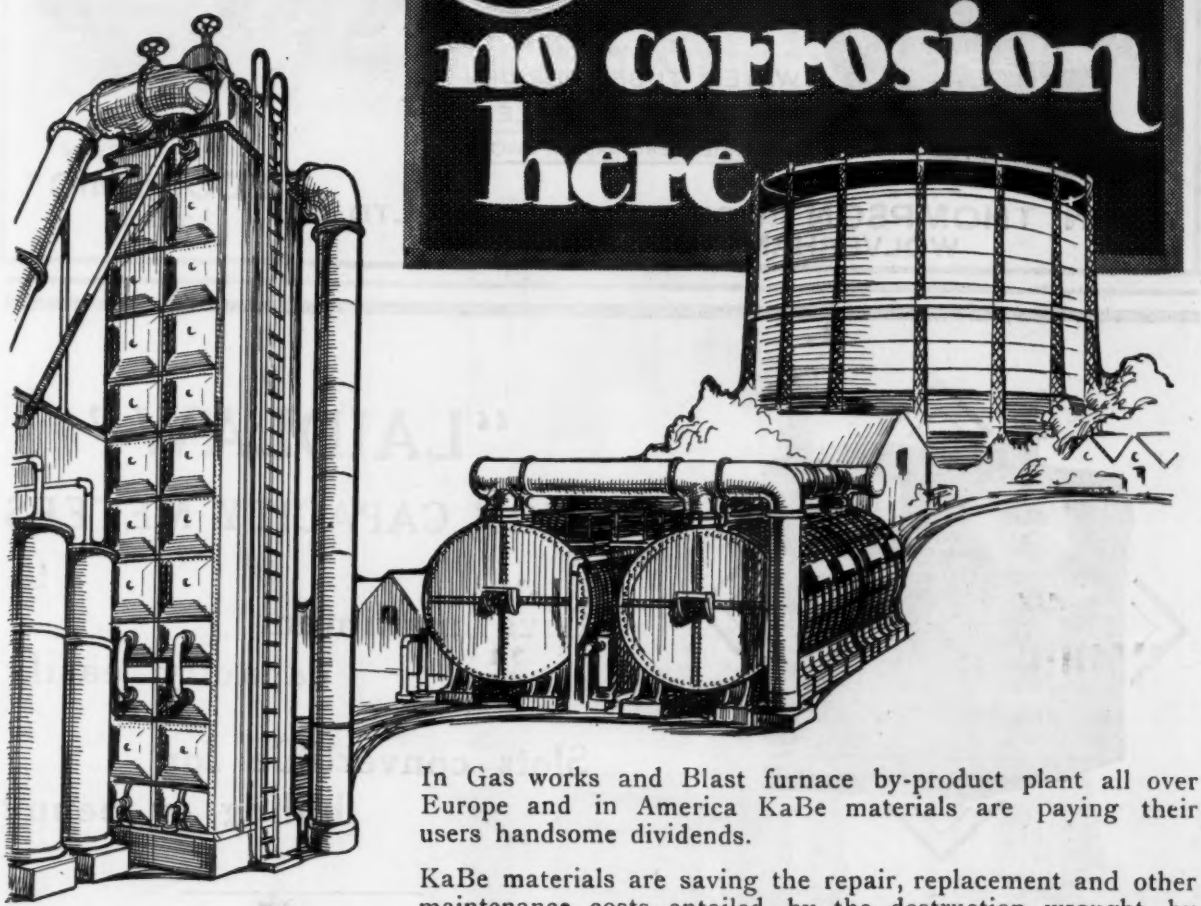
There is a complete range of "GUNFIRE" Controllers to meet every lighting requirement.

The "GUNFIRE" Controller of to-day embodies the same principle that we used in 1898, and which has built up a reputation second to none. Now universally adopted, the "GUNFIRE" is a guarantee of satisfaction—being reliable, efficient, and economical in service

Have "Gunfires" and no regrets

BRITISH, FOREIGN & COLONIAL
AUTOMATIC LIGHT CONTROLLING Co., LTD.,
BOURNEMOUTH

There's... no corrosion here



In Gas works and Blast furnace by-product plant all over Europe and in America KaBe materials are paying their users handsome dividends.

KaBe materials are saving the repair, replacement and other maintenance costs entailed by the destruction wrought by corrosion in the unprotected gas works.

KaBe materials are proof against corrosion by acid and alkaline chemicals, salts, oils and spirits and their fumes.

They are immensely strong and highly resistant to the hardest wear and their uses in the Gas Industry almost unlimited.

because KABE treatment prevents corrosion

● *KaBe Tiles, Mortar, Pastes, Paints, Lacquers, and Zeta Bricks and Blocks afford the Gas Industry a new opportunity of improving its balance sheet by cutting out the losses due to corrosion, because KaBe treatment prevents corrosion.*

H. Windsor & Co Ltd

LONDON OFFICES

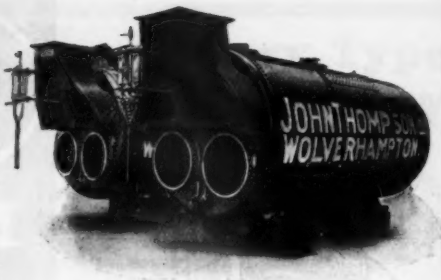
748 FULHAM ROAD, S.W.6 - - 34 VICTORIA STREET, S.W.1

Telephone: PUTNEY 2118 and 3727 *Telephone: VICTORIA 9331-2*

NEW "Thompson"

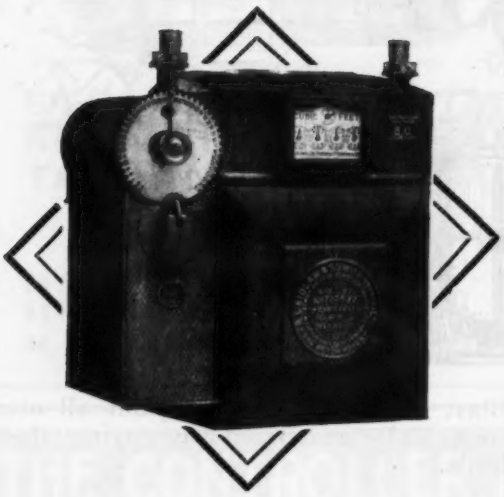
BOILERS EX STOCK

MOST MODERN "DISH-END" TYPE
WITH CORRUGATED SECTIONS
Standard Sizes in Stock
ALSO
WATER TUBE, CORNISH
AND VERTICAL BOILERS
SUPERHEATERS AND PIPEWORK



JOHN THOMPSON "ECONOMIC" BOILERS

JOHN THOMPSON (WOLVERHAMPTON) LTD.
WOLVERHAMPTON, ENG.



"LAIDLAW"
HIGH CAPACITY METERS

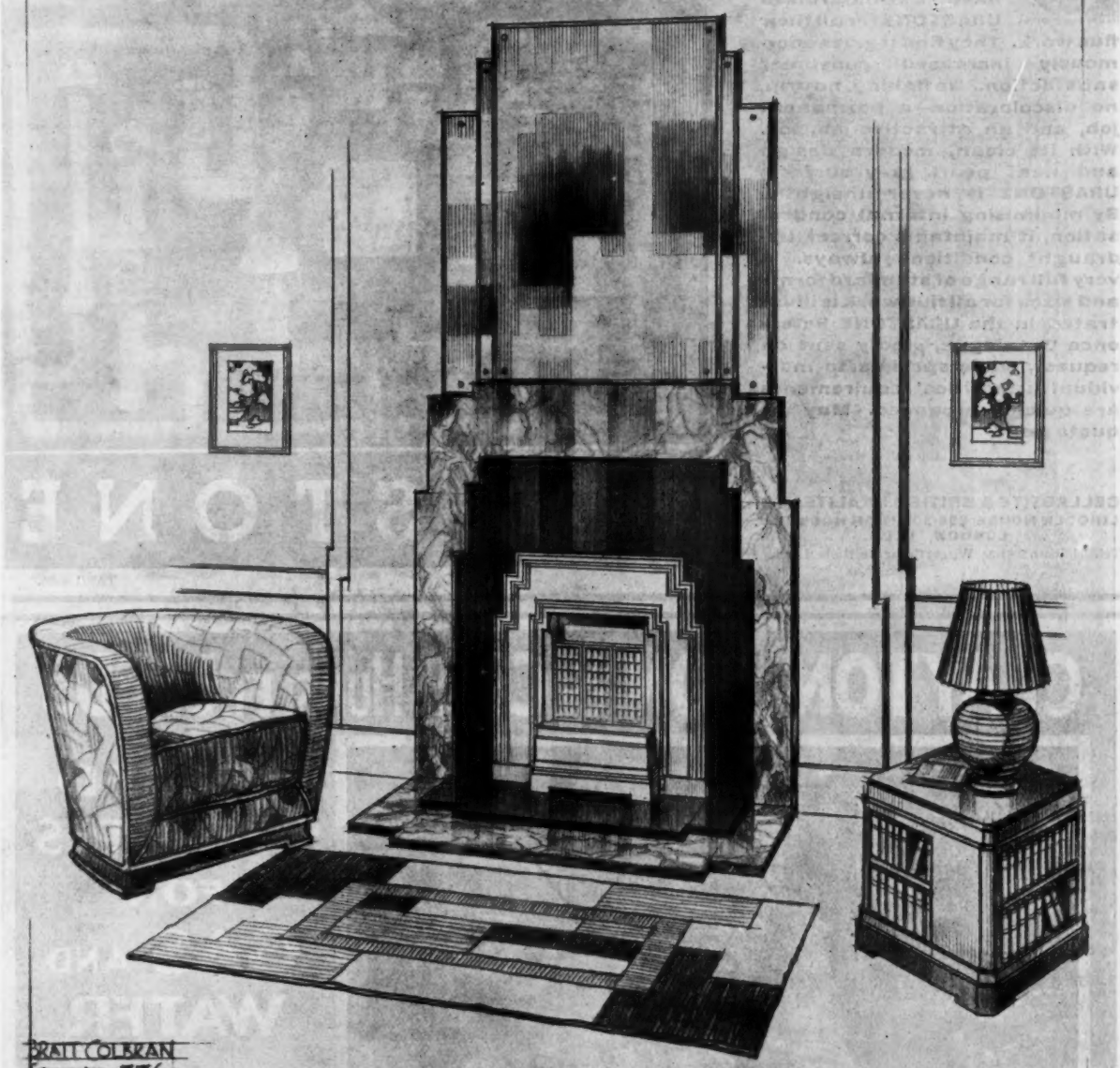
Give maximum capacity easily

Slots convertible for shilling or penny

R. LAIDLAW & SON (Edin.) LTD.
SIMON SQUARE WORKS, EDINBURGH
6, Little Bush Lane, Cannon Street, London, E.C.

140 *Therms per ton of coal,* 400 *B.Th.U. Gas*
NO CLINKERING.
THE MOORE GAS PLANT
Produces Coal Gas, Water Gas, or Mixed Gas in any desired proportions
Full particulars may be obtained from the Licencees and Manufacturers—
ANDREW BARCLAY, SONS & CO., LTD.
CALEDONIA WORKS, KILMARNOCK

PORTCULLIS GAS FIRES
FOR DESIGN & CRAFTSMANSHIP



BRATT COLBRAN & CO. & THE HEAPED FIRE CO. LTD
10, MORTIMER STREET LONDON W.

PORTCULLIS GAS FIRES

The Gas Industry has enthusiastically welcomed the new high standard of gas fire efficiency introduced by the "Portcullis" series of gas fires.

CORROSION PROBLEMS? For pipes and fittings

Incorrosible URASTONE presents the logical solution . . .

SEE OUR EXHIBIT STAND L.G. 9-5 THE BUILDING CENTRE

Leading Gas Concerns have standardised URASTONE for all their flue work. They find it gives enormously increased consumer satisfaction. No flaking, no drip, no discoloration—a permanent job, and an attractive job, too. With its clean, modern design and neat pearl grey surface, URASTONE is never unsightly. By minimising internal condensation, it maintains correct updraught conditions always. A very full range of standard forms and sizes for all flue work is illustrated in the URASTONE Reference Catalogue, gladly sent on request, while specials to individual Authorities' requirements are quickly produced. May we quote you?

URASTONE

CELLACTITE & BRITISH URALITE LTD.
LINCOLN HOUSE. 296-302, HIGH HOLBORN, LONDON, W.C.1.
Tel.: Holborn 5291-2. Wires: Cellactite, Holb., London.

TAS/Us./96.

CLAYTON SON & Co LD., HUNSLET, LEEDS

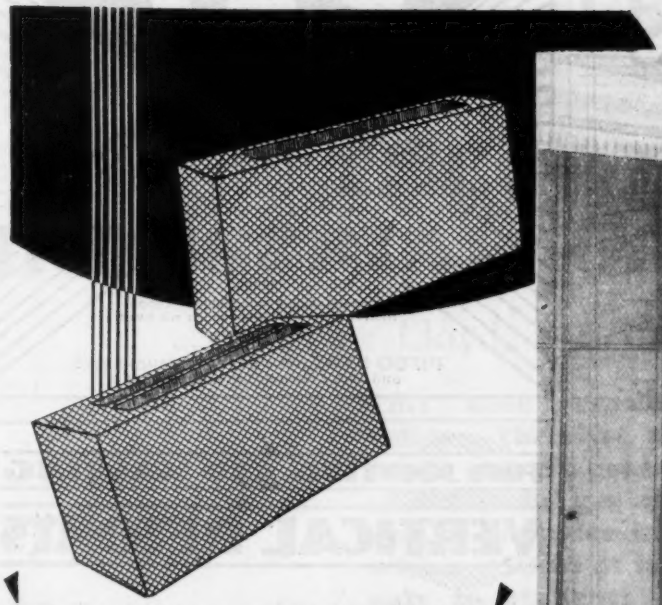
WELDED STEEL PIPES BEING LAID.

WELDED STEEL PIPES FOR GAS AND WATER

DIAMETERS 16" to 72"
LENGTHS UP TO 25 ft.
CEMENT OR BITUMINOUS LININGS.

LONDON OFFICE:
5, VICTORIA ST.
S.W.1.

INQUIRIES INVITED.



'PANELLA' gas fires 'NAUTILUS' flues...

WHEN—15 years ago—The Davis Gas Stove Co., Ltd. introduced the Nautilus Gas Flue, they were opening up possibilities for the introduction of gas fires into many thousands of houses, and wherever they have gone, gas heating has followed.

More recently, in another way the Davis Gas Stove Co., Ltd. have been the means of introducing gas heating into many houses from which otherwise it would very likely have been excluded. That is by means of the "Panella" Fire—the original gas fire of the flush-fitting type, designed as a result of the late Sir Lawrence Weaver's paper to the B.C.G.A. at York in 1930.

Experience counts. And when Gas Companies and others seek the advice of the Davis Gas Stove Co., Ltd. on gas flues and gas heating they know that they are placing themselves in the hands of a firm of very long experience.

Radiation

DAVIS GAS STOVE Co. Ltd
LONDON & LUTON

"TULLY" GAS

THE IDEAL GAS SUITED TO ALL MODERN NEEDS

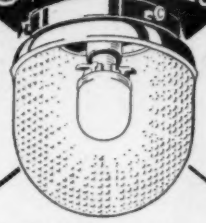
ECONOMICAL IN USE AND CHEAP TO PRODUCE

THERE ARE SEVERAL HUNDRED "TULLY" PLANTS IN USE AND NUMEROUS GAS WORKS ARE SENDING OUT ALL "TULLY" GAS

Sole Makers and Patentees:

TULLY, SONS & Co., LTD.
MILLGATE,
NEWARK-ON-TRENT, ENGLAND.

P·A·L
GAS GLOBES



UNBREAKABLE

SAVES MANTLES

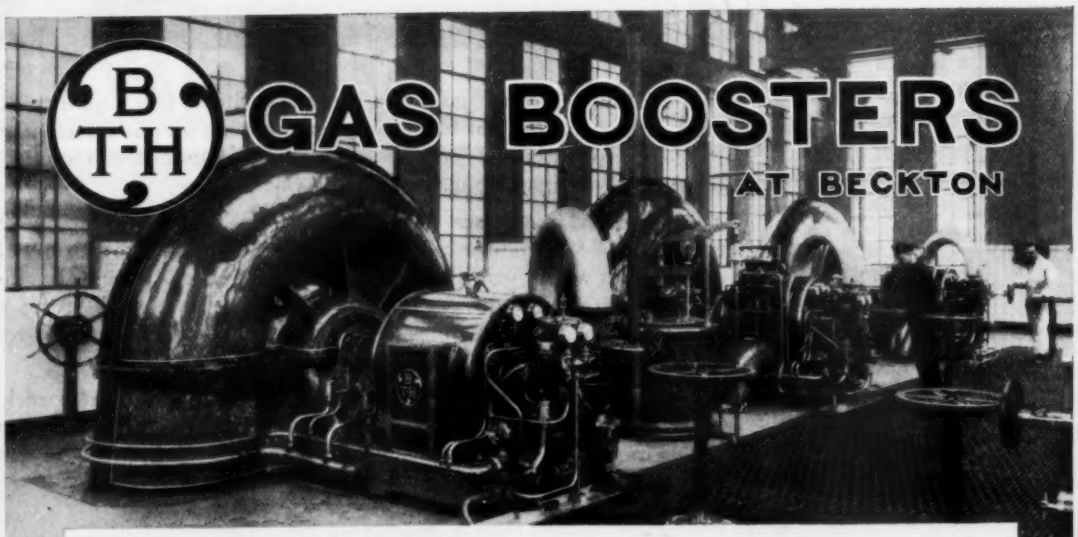
For Institutions and Works. Recommended by Fire Assessors all over the World.
Obtainable from factors or
PIFCO LTD., HIGH STREET, MANCHESTER and 150, Charing Cross Road, W.C.2.

FOR JOINTING AND WASHING
VERTICAL RETORTS

Drykos was specially manufactured to meet demands for a Fire Cement in Powder form and is stocked in several Grades; "Standard" is recommended for Fireclay Retorts and "H 3" for Silica Retorts and Bricks. For retort and furnace repairs, Drykos invariably gives satisfaction. Send for full particulars to Sole Manufacturers—
PURIMACHOS LTD., ST. PHILIP'S, BRISTOL.

Specify Drykos FIRE CEMENT

B T-H GAS BOOSTERS AT BECKTON



IN the Booster House illustrated, there are six **BTH** turbo-driven gas boosters capable of dealing with 15 million cu. ft. of gas per hour. Three of the sets have a capacity of 3 million cu. ft. per hour and three of 2 million.
These sets are installed at the Gas Light & Coke Company's Works, Beckton.
BTH has unrivalled manufacturing facilities for steam turbine and electric motor-driven compressors, blowers and exhausters.

BTH RUGBY

THE BRITISH THOMSON-HOUSTON COMPANY, LIMITED, RUGBY, ENGLAND A1544

In answer to an URGENT DEMAND

THEORY OF INDUSTRIAL GAS HEATING

BY

Peter Lloyd, B.A. Cantab., A.I.C.

This book represents, we believe, the first attempt to work out the general theory of industrial gas application, and it includes information which will be of interest not only to students and salesmen, but also to designers, manufacturers, and users of industrial gas equipment.

From a foreword by Mr. STEPHEN LACEY, Controller of Gas Sales, The Gas Light and Coke Company.

"The publication of the book is very timely, coming, as it does, when the Gas Industry is undertaking the organization of a Regional Scheme involving the setting up of a considerable number of centres which, properly co-ordinated, will be the means of developing the industrial gas load in the areas they respectively serve.

"In order that these centres shall serve their purpose effectively, they must be properly staffed with fully trained experts and technical salesmen; and it is for such men that this book is primarily written."

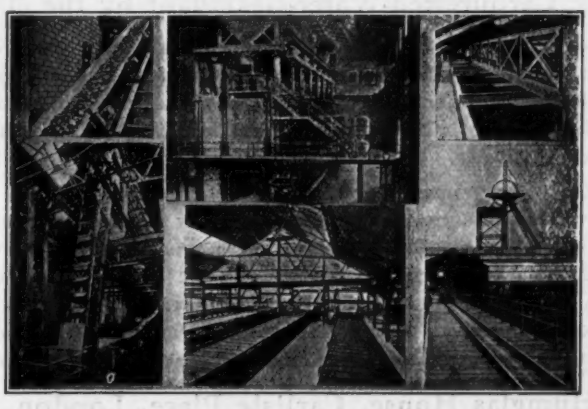
From a review by Mr. H. D. MADDEN, Engineer and Manager, Cardiff Gas Light and Coke Company.

"A great deal of time and money will be saved by the use of this new publication by men entering the industry in a specialized capacity. The primary application of available fuels, viz., solid, liquid, and gaseous, is dealt with in a straightforward and clear manner. The Properties of Town's Gas, the Principles of Combustion, and the Design of Burners for Industrial Operations are dealt with in such a way as to make the book an exceedingly valuable one as a guide and reference for the staff now engaged on research work and also industrial gas problems."

PRICE 6/- **[Post Free]**

WALTER KING, LTD., 11, BOLT COURT, FLEET STREET, LONDON, E.C.4.

GOODALL, CLAYTON & CO., LTD., LEEDS.



CONVEYORS, ELEVATORS, COAL BREAKERS, BUNKERS, ROOFS, HOISTS, Etc.

RETORT SETTINGS PRODUCERS, FURNACES REPAIRS.

COAL AND COKE SCREENING & SIZING PLANTS.

Humphreys & Glasgow Ltd.

Recent
"Labourless" Carburetted-Water-Gas Plant

EDINBURGH

May, 1933

Guaranteed capacity, with hitherto difficult Scotch Coke, 2,300,000 cu.ft. gas daily.

The Official Test of this Installation showed the following *Actual Results* without any allowance for the adverse effect of excess impurities in the generator fuel:

Total gas made during test	17,732,000	cu.ft.
Gas production per 24 hours	2,535,000	cu.ft.
Calorific value of gas	503·5	B.Th.U.
Oil used per 1,000 cu.ft.	1·996	galls.
Dry Scotch coke used per 1,000 cu.ft.	27·1	lbs.
Fixed carbon actually consumed in generator per 1,000 cu.ft.	22·86	lbs.

This 22·86 lbs. of carbon per 1,000 cu.ft. also produced automatically 57·1 lbs. of steam (from and at 212°F.) for use in the plant, and gasified 1·996 gallons oil.

The above Results, obtained when gasifying coke containing 74% fixed carbon and using just under two gallons of oil per 1,000 cu.ft., correspond to the following thermal yields from the raw materials:*

1·28 therms as oil gas from each gallon oil gasified, in addition to residual oil-tar—about 15% of the oil used.

92·1 therms as blue-gas from each 1,000 lbs. dry coke, in addition to production of the above waste-heat steam and the gasification of the oil.

**Computed by the method described in the Proceedings of The Institution of Gas Engineers, 1927-8, p. 526.*

Extract from THE SCOTSMAN of July 22nd, 1933, describing Inspection of the New Carburetted-Water-Gas Plant by the Town Councillors.

"The new Carburetted Water Gas Plant ..... is chiefly impressive on account of its automatism. There is a control table with an intricate arrangement of levers and valve apparatus, which differs from most controls in requiring no controllers. The levers go back and forward, turn sections of the machinery on and off, and generally function as if there were present Mr. H. G. Wells' 'Invisible Man' who, unseen, was operating the various lever handles.

..... A chance comer happening on the elaborate plant in its special building might have the impression that it was out of action. The functioning is practically silent. There is only the faint click of the control levers and there is no other sign of movement. During the visit one of the staff, by intentionally interfering with the automatic control made a 'fault' in the processes that were going on. ..... Then the whole system came to a standstill and the blare of a horn automatically drew attention to the fact that something was wrong. This was not all. A telltale lever indicated exactly which part of the apparatus was at fault, and as soon as this was rectified, the Robot-driven machinery proceeded once more to function."

Humglas House, Carlisle Place, London, S.W. 1.

CONTENTS

EDITORIAL NOTES.

A GLANCE AT THE CONTENTS . . . 635
Seven Years' Proof 636
Extraordinary Flexibility 636
Coke Oven Gas 636
A Useful Survey 637
A Suggestion 637
"Let's Have Lights" 637

Forthcoming Engagements 635
1933 "JOURNAL" Directory 635
Obituary—
William Doig Gibb 638
Appreciations 638–40
Personal—
Presentation to Mr. J. E. Stanier . . . 640
Presentation to Mr. W. P. Smith . . . 640

CORRESPONDENCE.

Liquor Effluents and Ammonia 641
Fire at Edinburgh Meter Works 641

NEWS OF THE WEEK.

Paragraphs 641
Floodlighting Celebrates Morpeth's Gas Centenary 641

NEWS OF THE WEEK—(*continued*).

Gas to Displace Petrol—Important Step by Lincoln City Council 642
Special Travelling Concessions for the B.I.F. —Twenty-Two Countries Included . . . 642

SPECIAL ARTICLES, &c.

Layout of a Swedish Gas-Works 642
Complete Gasification—Seven Years' Success at Mill Hill 643
Road Tar and Safety—Work of the B.R.T.A. 644
Notes on Plant and Processes 645
A Gas Fire Display at Minehead 646
New "Service Centre" for Croydon Company 647
Michle Gas-Works of the Prague Municipality 648
Bridging a Century—A Hundred Years of Gas in Granthan 648
Hundred Years of Gas in Dorchester . . . 649
Gas Floodlighting of Exeter Cathedral . . 650
Book Review 654
A Novel Gas Fire Campaign—"Personal" Letters to 14,000 Newcastle Consumers . 654
Public Works, Roads, and Transport Exhibition 655

"JOURNAL" TECHNICAL RECORD.

Annual Convention of the American Gas Association—
The Commercial Development of the Gas Industry in Great Britain. By T. P. Ridley, F.C.I.S. 651
North of England Gas Managers' Association (Auxiliary Section)—
Meeting in Newcastle 657
Town Gas Supply from Coke Works. By Dr. G. P. Lishman, F.I.C. 657

MISCELLANEOUS.

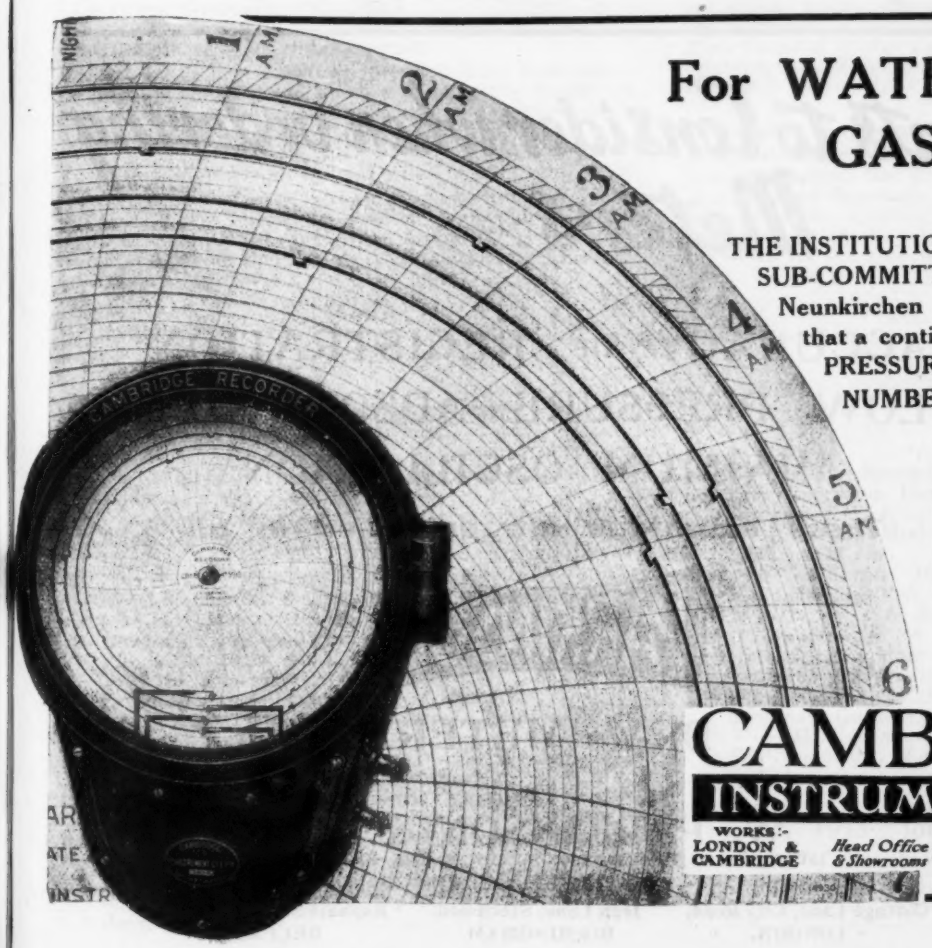
Oriental Gas Company—Annual General Meeting 659
Danish Gas Company 661
Colonial Gas Association, Ltd. 662
Corporation Undertakings' Results . . . 662

GAS MARKETS AND MANUFACTURES.

Stock Market Report 662
Current Sales of Gas Products 662
Contracts Advertised To-Day 662

Stock and Share List 663

For Advertisers' Index see End of "JOURNAL"—PAGE 669.



For WATERLESS GASHOLDERS

THE INSTITUTION OF GAS ENGINEERS SUB-COMMITTEE, reporting on the Neunkirchen accident, recommends that a continuous record be kept of PRESSURE conditions, and the NUMBER of PUMP RUNS.

The instrument shown records the time and duration of the operation of tar pumps. It can be supplied with one, two, three or four recording systems and can be arranged to record pressure also, on the same chart.

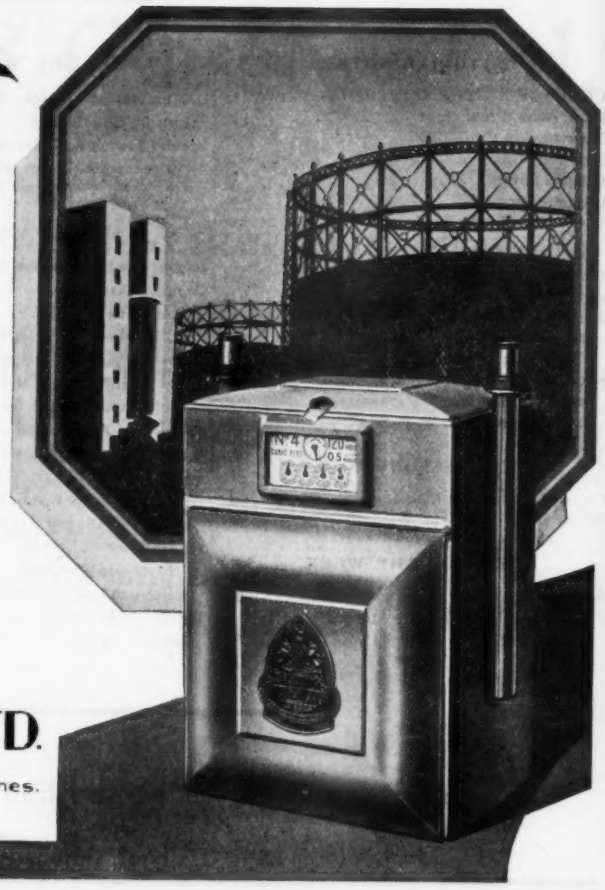
LIST 143-D
gives full details.
May we send you a copy?

CAMBRIDGE INSTRUMENT Co LTD

WORKS:- LONDON & CAMBRIDGE
Head Office & Showrooms:- 45, GROSVENOR PLACE LONDON, S.W.1

31

Empire Products



The most vital parts of a meter are its leathers, and upon their quality depends the service of the meter. The best meter leathers are Empire produce and the Empire is combed to provide the Thomas Glover quality. Only one quality can be used, and that is the best.

THOMAS GLOVER & CO. LTD.
Original Dry Meter Makers : Established in 1844.
Gothic Works : EDMONTON. LONDON N18. & Branches.

Some Points to Consider when ordering Meters :-

METERS

ACCURACY OF REGISTRATION
LOW PRESSURE ABSORPTION
MINIMUM OSCILLATION

These essentials are embodied in all

PARKINSON

DRY METERS

W. PARKINSON & CO.
INCORPORATED IN PARKINSON & COWAN (GAS METERS) LTD.
TERMINAL HOUSE, LONDON, S.W.1.

Cottage Lane, City Road, LONDON.
Iron Lane, Stechford, BIRMINGHAM.
Raphael St., Cromac St., BELFAST.

THE GAS JOURNAL

NOVEMBER 29, 1933

Vol. 204. 85th Year No. 3680

A Glance at the Contents—

Public Lighting Inspector Required.

A Gas Department invites applications for the post of Public Lighting Inspector. [p. 668.]

Oriental Gas Company.

A satisfactory state of affairs as regards the progress of gas in Calcutta was revealed at the Annual Meeting of the Oriental Gas Company held last week. [p. 659.]

Centenary of Gas at Dorchester.

On the completion of a hundred years of gas supply at Dorchester, some notes are published of the history and progress of the Company since its inception. [p. 649.]

Accountant Needed.

Applications are invited for the position of Accountant to a gas undertaking in the North. Candidates must be qualified Chartered or Incorporated Accountants, and must have strong personality. [p. 666.]

New Gas Showrooms at Addiscombe.

Attractive new showroom premises have been opened recently by the Croydon Gas Company in the rapidly expanding district of Addiscombe, where an admirable site in a busy shopping centre has been chosen. [p. 647.]

Town Gas Supply from Coke Works.

The supply of gas for town purposes from the Lambton Coke Works formed the subject of an address by Dr. G. P. Lishman, F.I.C., before the Auxiliary Section of the North of England Gas Managers' Association at Newcastle on Nov. 25. [p. 657.]

Post of Secretary Vacant.

Applications are invited by the South Metropolitan Gas Company for the position of Secretary. [p. 666.]

Public Works, Roads, and Transport Exhibition.

A description is given of some of the exhibits at the Public Works, Roads, and Transport Exhibition which are of more direct interest to the Gas Industry. [p. 655.]

Complete Gasification.

The success which has attended the operation of two Humphreys & Glasgow complete gasification plants at the works of the North Middlesex Gas Company is explained by an illustrated article on p. 643.

Further Examples of Gas Floodlighting.

Photographs of two fine installations of gas floodlighting appear to-day—the one at Morpeth, in celebration of the centenary of gas street lighting, and the other of the West Front of Exeter Cathedral in commemoration of the octocentenary of the consecration of the building. [pp. 641 and 650.]

Commercial Development of the Industry.

Contributing to the Annual Convention of the American Gas Association, Mr. T. P. Ridley, F.C.I.S., Commercial Manager and Secretary to the Newcastle-upon-Tyne and Gateshead Gas Company, discussed the commercial development of the Gas Industry in Great Britain and referred to its enviable record for trustworthy public service. [p. 651.]

Forthcoming Engagements

Dec. 1.—WESTERN JUNIOR ASSOCIATION.—Meeting at Bath. Address by Mr. F. P. Tarratt.

Dec. 2.—SCOTTISH EASTERN JUNIOR ASSOCIATION.—Visit to R. & A. Main, Ltd., Falkirk. Paper or Cinema Display.

Dec. 5.—N.G.C.—Meeting of Central Executive Board, Hotel Metropole, W.C. 2, 12 noon. (This meeting will take the place of the monthly meeting of the Board, which normally would have been held on Dec. 12.)

Dec. 6.—MANCHESTER AND DISTRICT JUNIOR ASSOCIATION.—Visit to Thomas Glover & Co., Ltd., Manchester. Lecture on the "Manufacture of Meters."

Dec. 7.—MIDLAND JUNIOR ASSOCIATION.—Meeting. Paper by Mr. G. H. Davies.

Dec. 8.—LONDON AND SOUTHERN JUNIOR ASSOCIATION.—Meeting. Paper by Mr. H. J. Risby.

Dec. 9.—SCOTTISH WESTERN JUNIOR ASSOCIATION.—Meeting. Paper by Mr. A. Bujnowski.

Dec. 11.—I.G.E.—Meetings of Finance Sub-Committee, 2 p.m.; Membership Sub-Committee, 2 p.m.; General Purposes Committee, 3 p.m.; Benevolent Fund Committee of Management, 4.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 12.—I.G.E.—Meetings of Council, 10 a.m.; Gas Education Executive Committee, 4 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 14.—S.B.G.I.—Meeting of Council, 56, Victoria Street, S.W. 1, 2.30 p.m.

Dec. 16.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting at Huddersfield. Presidential Address.

Dec. 16.—WALES AND MONMOUTHSHIRE JUNIOR ASSOCIATION.—Meeting at Cardiff. Paper on "Modern Methods of Manufacturing Malleable Iron Pipe Fittings," by Mr. C. E. Green.

Dec. 20.—B.C.G.A.—Meeting of Executive Committee, 28, Grosvenor Gardens, S.W. 1, 12 noon.

Dec. 21.—I.G.E.—Meeting of Refractory Materials Joint Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

1933 "JOURNAL" Directory.

Page 72. WELLINGBOROUGH. A. S. Campbell appointed S. & C.M. C. C. Wood appointed E. vice J. T. Lewis, deceased.

EDITORIAL NOTES

Seven Years' Proof

THE many manifest advantages of a single-stage process for the complete gasification of coal must appeal to our readers—perhaps more particularly now than hitherto. Five years ago—actually in the "JOURNAL" for March 13, 1929—we published an article describing a complete gasification plant installed at the works of the North Middlesex Gas Company. This plant interested us very much indeed, and we felt at the time that it would fully justify its installation. That it has done so will be obvious from an article on later pages. The first unit, erected in 1925, has been considerably improved, and a new set was put in in 1929. Since the first set was put to work an increasing proportion of the works' output has been supplied by the complete gasification plant, until, by the winter of 1930-31 (October-March), half the total gas sent out by the Company was produced by the two complete gasification sets. In that period 3570 tons of coal were gasified; last winter the corresponding figure was 4654 tons. No less than 25,560 tons of coal have passed through the plant, equivalent to 1355 million c.ft. of gas, without taking into account the gas made from oil during the carburetting process.

The experience gained has been most valuable; and the collaboration of the makers of the plant—Messrs. Humphreys & Glasgow, Ltd.—and the North Middlesex Company has resulted in an installation which is thoroughly satisfactory and which will, we have no doubt, attract the attention of all gas engineers. Last week, thanks to the courtesy of Mr. L. Trewby, the Gas Company's Engineer and Manager, we had the opportunity of examining the improved plant; and we would like to thank Mr. F. J. Pearce, who has had the plant under his control, for explaining to us all its new features. The plant at the Mill Hill Works is likely, we think, to re-establish confidence in complete gasification as a process capable of meeting the practical conditions of gas-works operation. It is certainly a first-class engineering job.

It is unnecessary here to detail the construction of the plant, but we may well emphasize an important point. The sensible heat of the water gas produced is not by itself sufficient to carbonize the coal. Hence additional heat is transferred from the carburettor and superheater by circulating some of the gas produced during the back-run, while admitting the usual back-run steam, which is in turn superheated with it. In the Mill Hill plant, which represents the latest design of Humphreys & Glasgow, the energy of the back-run gas-making steam itself, in expanding down to plant pressure, is utilized in a specially-designed injector to effect the circulation of the back-run gas. The economies of this method will be fully appreciated from the article on later pages. Another highly interesting feature of the plant is that tar cracking can be carried out efficiently. A process has been developed whereby either carburetted water gas tar or coal tar, or a mixture of both, can be efficiently cracked without trouble or nuisance from lamp black deposits or the production of pitch. It has been found possible to convert into gas considerably more tar than is produced by complete gasification, and up to 1 gallon per 1000 c.ft. of gas made has been dealt with. A saving of from 8 to 10 lbs. of coke and an enrichment effect of from 20 to 30 B.Th.U. per gallon of tar, depending on the quality of the tar, are obtained. The whole of the hydrogen in the tar is accounted for in the enrichment effect produced. Last year the Company cracked 170,000 gallons of tar and reduced the quantity of gas oil used by some 59,000 gallons.

Extraordinary Flexibility

THE plant can be changed over from coal to coke or *vice versa* with ease, and, on coke, working is similar to the H. & G. carburetted water gas set, with the additional efficiency due to the preheating, by the sensible heat of the back-run water gas, of the coke in the upper part of the generator or carbonizing chamber.

Caking coals of the type normally carbonized in gas-works can be efficiently and easily handled by the plant. The North Middlesex units have been working almost entirely on standard gas coals from the South Yorkshire fields, and from time to time Durham coal has been used. In the case of a French plant erected at Monaco, sea-borne Durham coals have been exclusively used, and no difficulties are being experienced in handling them. The advantage of being able to utilize in the plant the gas-making coals that normally must be provided for the works carbonizing plant, and the ability to dispense with the provision of special types of coal which has been former experience, are obvious.

A yield of 180 therms per ton of coal is obtainable—an increase of about 20% over the yields from earlier types of complete gasification plant and approximately 15% over what might be considered best practice in the two-stage complete gasification of coal in horizontal retorts and separate water gas plant. Figures given in the article show a yield of 182·8 therms of 340 B.Th.U. gas per ton (dry) of Rothervale (South Yorkshire) gas nuts. Tests carried out on the Monaco plant, using Londonderry (Durham) sea-borne coal—a highly swelling and strongly caking coal—have actually shown a yield of 208 therms of 340 B.Th.U. gas per ton.

In addition to this considerable increase in thermal yields, which cannot lightly be dismissed, there are many other advantages of the H. & G. plant embodying the single-stage coal gasification system due to its extraordinary flexibility of operation. This flexibility of operation and ability to meet the varying peak loads normally experienced in British gas-works practice have been well demonstrated during the extended experience of the working of the plants at North Middlesex. As we have said, it has proved a simple matter to change over the operation of the plant from coal to coke working, so that in the event of a coke slump the plant can be operated to maximum capacity and efficiency as a user of coke for the production of blue water gas or carburetted water gas, while, alternatively, at times of heavy coke sales or in emergency, the plant can be used for the production of gas, carburetted to any desired calorific value, *direct from coal*—the raw material always available—thereby enabling gas peak loads to be carried without encroaching on valuable or depleted coke stocks.

Our article on later pages will prove of more than passing interest to all concerned with gas production.

Coke Oven Gas

LAST Saturday an unusual paper was given at a meeting of the Auxiliary Section of the North of England Gas Managers' Association. The author, Dr. G. P. Lishman, described the method of gas production for town supply at the Lambton Coke Works; and the purpose of his paper was to see whether, "by a certain amount of heart-to-heart talk," improvement in working could not be effected. This approach is a good one, and is indicative of the value of such meetings as the one referred to. The Lambton Coke Works supplies Sunderland with part of its gas, boosted via a 15-in. main 8 miles long. An

interesting feature of the works is the provision of a small holder for taking care of the gas which would otherwise be wasted on the Simplex regenerative battery at the time of reversal. The course of the flue gases of these ovens is reversed every half hour so that the regenerators may retain their heat. At the moment of reversing the dampers, however, one regenerator is full of nitrogen and carbon dioxide. When the air starts to come up through this regenerator owing to the reversal of the dampers the gas naturally will not burn until the waste gases are cleared out of the regenerators. So, instead of putting this live gas through the oven flues and causing the chimney to smoke, by altering two valves the gas is put into the holder for 3 minutes. The amount is usually 1500 to 2000 c.ft. As this reversal happens 48 times a day, an appreciable amount of gas is saved.

The gas produced is dried in a Holmes plant, and is also washed for naphthalene. Dr. Lishman gives useful working figures of the gas drying plant, mentioning that the cost of calcium chloride amounts in his case to 0·044d. per 1000 c.ft. of gas treated. Discussing naphthalene washing, the author explains that, having no water gas plant to use up the spent oil, he has to rejuvenate it by continuously withdrawing some 20 gallons per hour and putting it through a naphthalene stripping plant. This reduces the naphthalene content of the oil from 3·5% to 2·8%; and in these circumstances the gas can be kept down below 1 grain per 100 c.ft. The gas enters the naphthalene washer containing 10-12 grains of naphthalene per 100 c.ft.; and taking 1½ million c.ft. of gas per day, this means that 24 lbs. of naphthalene per day has to be got out at the oil recovery plant. The cost of running the whole plant, however, is not heavy. For the first twenty months at Lambton it has been heavier than need be, but even so it has amounted to only 0·05d. per 1000 c.ft. for oil and an all-in working cost, including drying and labour, of 0·173d. per 1000 c.ft.

A *Useful Survey*

To-day we conclude publication of the British papers presented at the annual meeting of the American Gas Association in Chicago, our final contribution being by Mr. T. P. Ridley, of Newcastle-upon-Tyne, on the commercial development of the Gas Industry in Great Britain. Apart from the interest which the paper had to gas executives in the United States, for it gave them a bird's-eye picture of the development and present position of the British Gas Industry, it will, we have no doubt, serve for some time as a useful reference for gas administrators in our own country. In the wealth of statistics and information given by Mr. Ridley there are several significant features, but space limitations prevent our referring to more than two. The first thing which strikes us is the author's explanation of why it is that the consumption of gas has not of recent years progressed at the same rate as the increase in the number of consumers. The reasons he sets out are that the small houses constitute the largest proportion of new consumers, that by extensive building since the war there are fewer cases of more than one family living in one house, and that severe trade depression which has existed—and until recently gradually deepened—during the last ten years has necessitated economy. The Gas Industry of to-day, however, is better equipped than ever to meet competition; it is more vigorous and better managed than at any other period of its long history. On this question of consumption per consumer, an analysis of statutory undertakings shows that the consumption per consumer is greater for companies than municipalities, and greater for companies with dividend incentives than for companies with maximum dividends, which generally are earned with ease. As to non-statutory undertakings, though these number 600, they only supply small and sparsely populated areas, and their sales represent less than 3% of the Industry's total sales.

Then, discussing meter reading and billing, Mr. Ridley maintains that it is much more costly to render and collect accounts twelve instead of four times a year. He calculates that if monthly billing was introduced by his own undertaking the cost per consumer would be double that of quarterly billing; and he remarks that one of the largest and most enterprising electricity undertakings has abandoned monthly billing and submitted the quarterly account system for their domestic consumers. Still, important gas undertakings in this country have adopted monthly accounts during recent years, and have found the plan a good one.

A *Suggestion*

Nobody cares to be advised to copy someone else, but it is not infrequently a desirable course to adopt, and so, at the risk of incurring unpopularity, we would suggest that the Gas Industry might do worse than take a leaf out of the book of the Coal Utilization Council Birmingham Area Committee, who have prepared a printed message for sending out with coal accounts.

This message is to those who are engaged in selling British coal, but gas consumers could be appealed to on very much the same lines; for here is the gist of what the Committee have to say: "If you hear of any proposition to erect new buildings, new houses, new housing schemes, new factories, cinemas, churches, institutes, libraries, or similar establishments, please advise the Secretary immediately. Do not assume *that somebody else will have done it, do it yourself.* If you learn of any coal consumer who contemplates changing to oil (or any oil consumer who contemplates changing to coal), please do not rely entirely on your own efforts to convince him coal is best. Advise the Secretary immediately, and he will obtain expert opinion to assist you. Help in the work of obtaining new customers for coal, and you will help yourself, help the Committee, help the Coal Utilization Council, and help the Nation."

If coal, why not gas, which possesses advantages of its own as a fuel?

"*Let's Have Lights*"

When relating in last week's "Journal" some sad delinquencies on the part of electric lighting, reference was made to the giraffe, but this time there comes into the picture the King of Beasts; for it was while a trainer had six lions performing upon the stage of the New Theatre, Cardiff, that he suddenly shouted: "Lights, the lights; for God's sake, let's have lights." The explanation? There had been a sudden failure of the lighting, "caused by a slight defect in the plant at the Hayes sub-station, which supplies the centre of Cardiff with electricity."

We take this description from the *South Wales Echo:* "Sullen and watchful eyes had followed every move of the trainer, and watched the whip which occasionally cracked ominously. Then came the black-out. . . . On the stage the trainer was frantically endeavouring to get his charges through a small door for safety. The orchestra leader struck matches and kept his band playing. A man in one of the boxes turned the beams of a small torch on to the stage, where the trainer still was valiantly endeavouring to get the animals away. . . . It was all over in a few seconds—seconds fraught with terrible danger for the trainer, which even the audience did not appreciate. Those few moments of darkness imperilled his life; for, although he skilfully got five lions off the stage in less time than it takes to tell, the sixth provided a problem. Somehow he had got away from the rest, and lion and trainer were alone together in the darkness, each unaware of the exact position of the other. If they had collided, who knows what tragedy might not have occurred? Fortunately, however, the management was prepared, and measures to ensure the safety of the trainer were quickly adopted. Men with poles were at hand to protect him if need be, candles were brought—and the lights went up."

The lion tamer will not be in a hurry to repeat this experience. If he had time to think of anything but the lions, he must have wished that one other safety measure had been adopted.

OBITUARY

WILLIAM DOIG GIBB.

It was with a sense of personal loss that we recorded, as we were able to do but very briefly, in the major portion of last Wednesday's issue of the "JOURNAL," the death that morning (Nov. 22) of Mr. William Doig Gibb, O.B.E., M.Inst.C.E., of 166, East Dulwich Grove, London. Over a friendship of many years' standing we had found him ever kindly, ever courteous, and ever thoughtful of others—qualities which really are but due; yet what greater can be said of any man? Distinguished in the profession which he had made his own, his opinions and advice were sought by gas undertakings in all parts, subsequent to his relinquishment of official positions, first in the north, and afterwards in the south of England.

Mr. Doig Gibb was born at Dalkeith in 1866, and was the son of Mr. J. S. Gibb, Treasurer to the Edinburgh and Leith Gas Commissioners. He was educated at George Watson's College, Edinburgh; and, after having spent five years in the shops, he went into the drawing offices of what is now the Barrowfield Iron-Works, Ltd., of Glasgow, where he served a four years apprenticeship. The succeeding two years were passed in the Leith Gas-Works, which were at that time in charge of the late Mr. F. T. C. Linton. In 1892 he entered the service of the Newcastle and Gateshead Gas Company; his first position being that of Assistant Manager of their Redheugh station. From this he was promoted in 1894 to the management of the Elswick works. He co-operated with the late Mr. V. Wyatt, the Engineer of the Company, in their engineering work generally, and in 1897 was appointed Chief Engineer of the Company. This position he held until 1909, when he was appointed, at the age of 43, Chief Engineer of the South Metropolitan Gas Company. From this position he resigned in April, 1915.

It is recorded of him that in early life, during the time of his studies at technical colleges, he gained 19 class and special prizes and medals, 4 Queen's prizes, 15 first-class Government certificates, and 2 first-class City of London Certificates. This time of study he never forgot, and his memories made him always anxious to assist in every possible way young men who were passing through the period from which he himself had so very successfully emerged. His scholastic training and his practical experience in the engineering shops rendered him singularly well qualified to undertake the duties devolving upon him at one time as Examiner in "Gas Engineering" for the City and Guilds of London Institute, in which position he succeeded Mr. A. F. Browne a quarter of a century ago.

Mr. Doig Gibb joined the first Institution of Gas Engineers in 1895, and was elected to the Council five years later. In due course he passed into the amalgamated Institution, and occupied the Presidential Chair in 1908. A paper before the Institution in 1905 on "Structural Engineering" gained for him the silver medal.

He was admitted to membership of the North of England Gas Managers' Association in 1892 and was President of this Association in 1899-1900, and in the latter year he was elected to membership of the Institution of Civil Engineers. The esteem in which he was held by his colleagues in the North of England Association will be gauged by the fact that, on leaving the north, he was the recipient of a silver tea and coffee service and a silver salver, bearing the following inscription:

> Presented to W. DOIG GIBB, Esq., M.Inst.C.E.,
> by the North of England Gas Managers' Association,
> on his appointment as Chief Engineer to the
> South Metropolitan Gas Company,
> as a mark of esteem,
> and in appreciation of his services to the Association.
> 2nd October, 1909.

Further proof of the affection in which he was held by his fellow workers in the Newcastle and Gateshead Gas Company, was evidenced by a presentation to him, at a large gathering of officials and workmen, of a solid silver centre-piece, which was accompanied by a silver afternoon tea service for Mrs. Gibb, and a gold pendant for each of his two sons. It is interesting to note that Mr. Thomas Hardie, his successor at Newcastle, presided at this ceremony. When he left the north, Mr. Doig Gibb took an active interest in the Southern Association of Gas Engineers and Managers, of which he officiated as President during the year 1916.

When in the year 1915 Mr. Doig Gibb resigned his appointment as Chief Engineer of the South Metropolitan Company, the workmen members of the Co-Partnership Committee presented him with a handsome illuminated address, but a subsequent presentation by the staff officers of a silver rose bowl and candelabra was made privately in deference to the state of his health, which was at the time very unsatisfactory.

After a period of greatly needed rest, Mr. Doig Gibb proceeded, at the end of 1915, to devote part of his time to work for the country in connection with the High Explosives Department of the Ministry of Munitions. It was felt that his technical knowledge would be of considerable assistance in this respect, and with such a well known member of the gas profession there, the cordial relations which had been so quickly established between the Department and most gas undertakings would be still further strengthened. In the "JOURNAL" for Jan. 15, 1918, his appointment to the Order of the British Empire was noticed, for services in connection with the war, his name appearing in the list as Consulting Gas Engineer to the Explosives Supply Department of the Ministry of Munitions.

At a meeting of the National Gas Council in December, 1920, Mr. Doig Gibb was unanimously elected as Hon. Member of that body, while in the following year he was appointed Vice-President of the British Commercial Gas Association. When, at the beginning of 1921, appointments were made under the Gas Regulation Act, Mr. Doig Gibb became a member of a Committee which was formed to inquire whether it was necessary or desirable to prescribe any limitation on the proportion of carbon monoxide which might be supplied in gas used for domestic purposes.

In 1923 Mr. Doig Gibb was the recipient of the Birmingham Medal at the Annual Meeting of the Institution of Gas Engineers, when the President, Mr. J. D. Smith, of Belfast, said that he had richly deserved the honour; that he had reached a position of eminence of which they were all very proud; that they admired and appreciated the grit, determination, and capacity which had enabled him to attain his position; and that they were pleased to confer an honour on one who had enhanced the standing and dignity of their Industry.

Deepest sympathy is extended to Mr. Doig Gibb's widow and his surviving son, Mr. W. G. Doig Gibb.

The first part of the Funeral Service on Friday last was private, but at the Forest Hill Old Cemetery, where the interment took place, the affection in which our late friend was held was manifested by the large number present upon the arrival of the cortège and family mourners, with whom were Mr. Thomas Hardie (Brother-in-law) and Mrs. Hardie.

To mention all who attended would be impossible, and even were this done there would be absent from the list the names of many other friends who would have liked to show their respect by going to the Cemetery had not circumstances prevented. It should, however, be said that Dr. Charles Carpenter (President of the South Metropolitan Gas Company), and a large contingent from his undertaking, were at the graveside, while Mr. Frank P. Tarratt, President of the Institution of Gas Engineers, represented also Mr. Doig Gibb's old colleagues of the Newcastle-upon-Tyne and Gateshead Gas Company. Mr. T. H. F. Lapthorn (Chairman) and Mr. Thomas Carmichael (General Manager) of the Portsmouth Gas Company, and Mr. S. E. Whitehead (General Manager) of the Southampton Gas Company paid tribute on behalf of Undertakings of which Mr. Doig Gibb was a Director.

APPRECIATIONS.

Charles Carpenter, South Metropolitan Gas Company.

My friendship with the late Mr. Doig Gibb commenced as those of many others have done, on holiday. We were among a party of members of the Incorporated Institution of Gas Engineers who in 1897 visited Brussels and Amsterdam at the invitation of the Imperial Continental Gas Association and of the late Sir Corbet Woodall. I suppose that of all surroundings most conducive to the ripening of friendships 'board ship must take first place. The second I think I should award to an overland journey companionship. At any rate those were the circumstances under which Mr. Gibb and I met and talked of other matters than those only pertaining to gas. I liked his geniality, the phraseology of dry humour with which he invested his public utterances,

WILLIAM DOIG GIBB, O.B.E., M.Inst.C.E.

and above all his outstanding straightness and honesty of purpose. His ability as an engineer was already known to me; a word-picture of his father completed and rounded off my knowledge of the man (who was it gave the advice that in deciding upon a wife we should seek knowledge of her mother?).

When in 1909 pressure was exercised by the Board to recommend a Chief Engineer my thoughts turned naturally to Mr. Gibb, and the appointment was in due course made.

I had knowledge that changes from the cold " bosom of the North to the dew dropping South " sometimes exercised a baneful effect upon individuals by whom they were made, so before he settled upon a house I drove him in my car round the Blackheath district, which I knew well as an open and bracing one, and suggested it would be a convenient area in which to choose a house. But the charm of Dulwich Village proved a more powerful attraction for him, and in that Sleepy Hollow of a somewhat enervating peacefulness he settled down and lived up to last week. Although his health proved inadequate to the burden I had been responsible for placing upon him, nothing changed the sincerity of a remembrance which I am pleased to think I possessed until his unexpected death.

Attached to the Ministry of Munitions he did good civilian service for his country during the Great War.

Thomas Carmichael, Engineer and General Manager, Portsmouth Gas Company.

The passing of our friend and colleague, Mr. William Doig Gibb, O.B.E., M.Inst.C.E., has recalled the days of my engineering apprenticeship in the shops of the Barrowfield Ironworks, Glasgow, Mr. Gibb having some twenty years previously passed through the same training ground.

One of the years spent there, 1908, coincided with Mr. Gibb's Presidency of the Institution of Gas Engineers. I remember with what deep interest the " Gas Journal " was perused in those days for the speeches and technical contributions of one who had been so highly honoured at the early age of 42. At that impressionable time of my career, there was something of the nature of hero-worship for Mr. Gibb, and, in later years, when we became better acquainted, his sound judgment, exceptional ability, and scientific knowledge confirmed my early impressions.

Mr. Gibb was, in 1924, appointed a Director of the Portsmouth Gas Company, and his services on the Board have been invaluable in the progress and development of the Undertaking, and have been much appreciated by his fellow-Directors. He was at work until the last, and attended quite recently (although obviously not well) the inauguration of the new carbonizing plant at Hilsea Gas-Works, Portsmouth, in the construction of which he took a very keen and active interest.

Mr. Gibb was of a very unassuming nature, and this, combined with his charming and kindly manner, endeared him to the hearts of all who were privileged to be closely associated with him.

In his death, the Gas Industry has suffered a loss the measure of which must be known to many. The best interests of the Industry were his study and sole concern. His counsel was sought by all the leaders of the Industry, and it was freely given and of high quality. All those who knew him unite in mourning his loss and in sympathy with his bereaved family. Our loss is very real, and his passing will leave a gap hard to fill.

H. D. Madden, Engineer and Manager, Cardiff Gas Light and Coke Company.

The news of the death of Mr. W. Doig Gibb came as a shock to me, as to many of his friends. Although I knew he had not been well for some time, I was unprepared for the news of his death.

To me personally he was a friend, philosopher, and guide for many years past. To my Company he was a deeply respected adviser in all matters relating to parliamentary procedure and special inquiries.

Apart from his ability, his outstanding feature was his lovable nature and his kindly interest in the younger engineers. It was in this way I first came into personal contact with him, when he was Chief Engineer of the South Metropolitan Gas Company. We afterwards became great friends, which ripened into a strong family friendship. My wife and daughters, as well as myself, are saddened by the thought that we shall not have him in our home life again.

J. M. Campbell, Engineer and General Manager, Isle of Thanet Gas Light and Coke Company.

And so William Doig Gibb has been called to his eternal rest! To how many in the ranks of the Industry will there be stirred up memories of this great little man. With me, his lifelong friend, none who had the privilege of his acquaintance but will share in the intense sense of loss the Industry has sustained.

I recall his joyous entry into the Drawing Office at Barrowfield Iron Works, Glasgow, during the early years of my training, our subsequent studies (and successes) at the Technical College, then his departure, followed by our occasional meetings—mindful of the days when we were youths together.

Throughout these years he was always " Willie " Gibb. The cheery greeting, the firm handgrip, and the solicitous inquiry as to one's health and welfare were unmistakable in their sincerity. His friends were legion, he himself being always so kindly disposed, being the happy possessor of a nature that one could not help liking. His quiet unassuming demeanour was one of his outstanding characteristics, and it was impossible to feel anything but calm in Doig Gibb's presence, his personality radiating that sense of repose and stability which reveals a spirit of helpfulness and nobility of character.

His own personal interests were always secondary, while he was ever ready and willing to assist in advancing a

deserving aspirant along the road to success. Tactful and patient, he had the infinite faculty of amicably clearing up difficulties and settling disagreements which seemed well-nigh impossible.

The high official posts occupied and the honoured positions attained, so worthily upheld, were won mainly by his conspicuous ability, scrupulous integrity, and keen sense of duty, coupled with an overwhelming urge to defend and promote the general well-being of the Industry he loved so well. His tireless activities during the Great War, together with certain worries, undermined his health, from which he never wholly recovered; even so, he ever remained the same good, kind, genuine, and helpful Doig Gibb.

We reverently raise our hats to his affectionate memory, and deeply mourn with his widow and family the passing to the Great Beyond of a genial and lovable soul, and of whom what more fitting tribute could be paid than the following:

" He kept his honesty and truth,
His independent tongue and pen,
And moved in manhood as in youth
Pride of his fellow men.

" Strong sense, deep feeling, friendships strong,
A hate of tyrant and of knave,
A love of right, a scorn of wrong,
Of coward and of slave.

" A kind true heart, a spirit high,
That could not fear and would not bow,
Were written in his manly eye,
And on his manly brow."

Walter T. Dunn, formerly Secretary of the Institution of Gas Engineers.

Sincere regret will be occasioned, both in this country and abroad, by the announcement of the passing of Mr. W. Doig Gibb, M.Inst.C.E., Past-President of the Institution of Gas Engineers, not only because he was distinguished as an engineer of wide experience, particularly in those departments appertaining to the manufacture and distribution of gas, but as a man in the truest sense of that word.

In the duties associated with the Presidential Chair of the Institution, which he occupied in the year 1908, Mr. Gibb was ever mindful of the views of others, and invariably sought with the utmost tact to arrive at helpful and right decisions for the improvement of the status of the Industry. A Scotsman to the core, as the son of the late Mr. J. S. Gibb, Treasurer to the Gas Commissioners of Edinburgh, deceased upheld the high traditions of his countrymen north of the Border.

Mr. Gibb's appointment in 1909 as Chief Engineer to the South Metropolitan Gas Company was regarded by all his colleagues in the Institution as another of his achievements, and was hailed with sincerely expressed gratification.

The writer can testify to the heavy blow the loss of his second son in the war proved to be; but pride in the part played to some extent assuaged the bereavement. To his widow in this second trial all her friends will desire to extend the deepest sympathy.

* * *

The death took place on Friday, Nov. 17, of Mr. ALEXANDER RUSSELL, of Messrs. Alexander Russell & Co. (Glasgow), Ltd., after a short illness. Mr. Russell was one of the oldest members of the Scottish coal trade and had thus been, during the course of his life, in close contact with the Gas Industry both in Scotland and Ireland. In addition to being senior partner of Messrs. Alexander Russell & Co., Mr. Russell was Chairman of the New Cumnock Collieries, Ltd., and the South Ayrshire Collieries, Ltd., and had an extensive business in the exporting of gas coke to Scandinavia. To every one who came in contact with him, Mr. Russell revealed himself as a man of big personality with a very genial and generous disposition. Thus with the passing of Mr. Russell has been broken a link between the kindred industries, gas and coal.

PERSONAL

PRESENTATION TO MR. J. E. STANIER.

On Nov. 21, in the Board Room of the Gas-Works, Stockport, the staff of both the Engineering and the Accountancy Departments met to say " good-bye " to their Assistant Engineer, Mr. J. E. Stanier, who has just secured a similar appointment with the Stoke Corporation. Mr. T. Reynolds, Engineer and Manager, in making the presentation, referred to the service which Mr. Stanier had rendered to the Department, and said that during the time he had acted as his assistant they had worked amicably together with the common aim of furthering the interests of the Department. He congratulated Mr. Stanier on his appointment.

On behalf of himself and the staff he presented to Mr. Stanier a silver salver bearing the following inscription:

A token of esteem from the Engineer, Secretary,
and Staff of the Stockport Gas Department, to
J. E. STANIER, Esq.,
Assistant Engineer,
on his appointment to the Stoke Corporation.
November, 1933.

Mr. Stanier, in replying, said that every one of the days during the 14½ years he had been connected with the Department had been happy. He was deeply appreciative of the kind remarks made by Mr. Reynolds, and assured them that the beautiful present they had given him would always be a reminder of the delightful days he had spent with the Stockport Gas Department.

A presentation was also made to Mr. Stanier by the workmen of the Department, Mr. H. Barrett presenting him, on their behalf, with a smoker's set.

* * *

PRESENTATION TO MR. W. P. SMITH.

On Nov. 23 last members of the staff of the Gas Street and Lum Street Gas-Works of the Bolton Corporation Gas Department sat down to a hot-pot supper, and smoking concert, at the Aspin Hall, Bolton, at the kind invitation of Mr. W. J. Smith, the Gas Engineer, who was the host of the evening.

Mr. Smith gave a hearty welcome to the 250 men present, the occasion being a presentation to his son of a handsome chiming grandmother clock, bearing the following inscription:

Presented to W. P. SMITH, Esq., B.Sc.,
by the Staff and Workmen of the
Bolton Corporation Gas Department,
on his appointment as Manager at Fleetwood Gas-Works.
November 23rd, 1933.

The presentation was made by Mr. C. H. Bamber, B.Sc., Assistant Gas Engineer and Manager, and supported by Mr. R. Robertson. Mr. W. P. Smith thanked them for their kind expression of good wishes.

Mr. R. Yates and Mr. J. Alsop thanked their host for his hospitality and entertainment, and the remainder of the evening was spent in community singing, musical selections, &c., given by employees.

* * *

Alderman G. CLARK has been appointed Chairman of the Chesterfield Corporation Gas Committee and Alderman A. W. SWALE Vice-Chairman.

* * *

Mr. HAROLD LEE, a Director of the Wolverhampton Gas Company, left estate valued at £7048, with net personalty of £714.

* * *

At a meeting of Dundee Gas Committee last week it was decided to appoint Mr. H. S. JOHNSTON, second technical assistant in the department, first assistant, in succession to Mr. James Storrier, who has been appointed Gas Manager at Forres.

* * *

Mr. W. A. BISHOP, Sales Superintendent of the Croydon Gas Company, has been elected an Associate of the Institution of Heating and Ventilating Engineers,

Correspondence

Liquor Effluents and Ammonia.

SIR,—In the "GAS JOURNAL" of Nov. 15 last, in your report of my reply to the discussion on the 3rd Report of the Liquor Effluents and Ammonia Sub-Committee, you quote me as saying: "If you would avoid colour in the effluent from the sewage works, then you must have colour in your gas-works liquor." What I did say was that you must *not* have colour in your gas-works liquor. I should be greatly obliged if you would make the necessary correction of this accidental omission of the word *not*.

Yours, &c.,
A. KEY.

Gas-Works, Foleshill,
Coventry,
Nov. 25, 1933.

Fire at an Edinburgh Meter Works

SIR,—A rather serious fire occurred at our Edinburgh Works last Friday, when certain stores of material, &c., were destroyed. We are glad to say that production will not be interfered with. We would be glad if you would afford us the opportunity of expressing our thanks to our many friends in the Meter Trade who came forward with immediate offers of their assistance. Their kindness in doing so has been much appreciated by us.

Yours, &c.,
For R. LAIDLAW & SON (Edinburgh), Ltd.,
A. BROWN, *Secretary.*

Simon Square Works,
Edinburgh,
Nov. 27, 1933.

Pressure of Matter unfortunately compels us to postpone for a week the continuation of our report of papers and discussions of interest to "JOURNAL" readers which were read at a session of the Public Works, Roads, and Transport Congress held under the auspices of the Institution of Gas Engineers.

A New Gasholder was opened at the Works of the Heckington (Lincs.) Gas Company last Saturday. The Chairman of Directors, Mr. H. L. Lawrence, turned on the supply.

"**Dock Lighting**" will be the subject of a paper to be read by Mr. J. S. Preston, M.A., at a special meeting of the Illuminating Engineering Society to be held at Liverpool on Wednesday, Dec. 6 next.

Successful Demonstrations of Cooking organized by the Folkestone Gas and Coke Company have been given at Folkestone by Mrs. Stevenson, of Norwich. The demonstrations lasted five days, and during that time they were attended by more than 1500 people.

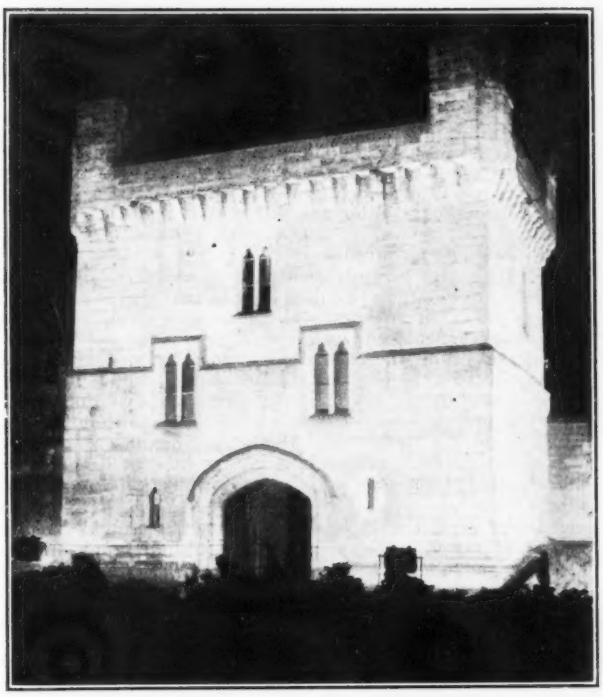
A Large Number of Distinguished Guests were present at the Annual Reception of the Institution of Chemical Engineers, held on Wednesday, Nov. 22, 1933, at the Waldorf Hotel, London, under the Presidency of Viscount Leverhulme, who was accompanied by Viscountess Leverhulme.

Nostell Colliery, Ltd., Nostell, near Wakefield, is installing the Hird process of low-temperature carbonization. The first unit of the battery will be in operation in January, 1934. Nostell Colliery produces coal which is very low in ash and sulphur content. It is intended that the smokeless fuel shall be marketed as "Nostlite Smokeless Fuel."

A Bill is to be Promoted by the Stockport Town Council, in which powers will be sought to extend the Corporation's limits for the supply of gas by the inclusion therein of part of the parish of Poynton-with-Worth, and the acquisition by agreement from the Poynton Collieries Company, Ltd., of the Poynton Gas-Works.

Nearly 1800 Persons were present at the opening of a gas exhibition recently in the Paignton Public Hall. Major S. Stansfield Vickers, D.S.O., a Director of the Torquay and Paignton Gas Company, performed the opening ceremony. The Company were, he said, putting into operation shortly a scheme whereby all gas fittings would be regularly inspected and put in perfect working order, free to the consumer, except in the case of mantles and broken parts. There would, therefore, be no excuse if they did not have a perfect service. He asked them to consult the Company at any time, and not to leave any defects until a difficulty arose.

Floodlighting Celebrates Morpeth's Gas Centenary.



The Morpeth Gas Light Company celebrated their hundredth anniversary in April last, when mention of this landmark in their history was made in these columns, and also last July when a Centenary Brochure was published in commemoration of the event. Last week marked another notable page in the Company's history. It is a century ago since Morpeth streets were first lighted by gas, and, to celebrate that important event, the shareholders, at the invitation of the Chairman and Directors, attended a conversazione in the Town Hall, and also viewed a fine display of floodlighting in different parts of the town, to record one hundred years of street lighting by gas. The buildings floodlighted by gas included the Castle and Clock Tower, and our photograph shows a close-up view of the floodlighted Gateway House of the Castle, which stands on a hill overlooking the town. The conversazione was largely attended, a cordial welcome being extended to those present by Major Ralph Crawford, Chairman of Directors.

An Increase of Nearly 6% is reported in the output of gas at Blackpool during the illuminations period compared with 1932. The output amounted to 164,331,000 c.ft. between Sept. 16 and Oct. 23, against 155,169,000 c.ft. last year. In the six weeks ended Nov. 22 the output was 158,008,000 c.ft.—an increase of 9,129,000 c.ft. (6·13%). The number of new customers added during October this year was 242.

Members of the Kidderminster Rotary Club on Nov. 21 made a tour of inspection of the local gas-works, when Rotarian Percy Dougall (who is an official of the Gas Company) made an interesting disclosure regarding the gas consumption on the day following a recent public announcement that the water supply was tainted, when official warnings were issued by the Town Council that all water required for drinking or cooking purposes must be boiled for at least ten minutes.

The Gas Industry in Spain.—A return lately issued by the Spanish Government shows that steady progress was made by the Gas Industry in Spain during 1932, there being 51 undertakings in the country. The aggregate production of gas, it is stated, has increased from 3706 million c.ft. in 1926 to 5373 millions during 1932, an advance in seven years of 72%. The output in 1931 amounted to 5195 millions, so that there was a progress in 1932 of 3·4%. According to the return, despite the increased output the total quantity of coal consumed by the Gas Industry in Spain declined from 437,497 tons in 1931 to 436,814 tons last year, indicating a higher gas yield per ton of coal carbonized, which latter, it is added, is now chiefly supplied by Spanish collieries, only 9685 tons having been imported during last year.

THE NEWS—continued.

Gas to Displace Petrol.

Important Step by Lincoln City Council.

Experiments which may result in the whole of the Lincoln Corporation's motor transport, including omnibuses, being adapted for running on compressed gas, instead of petrol, are about to be undertaken.

Mr. George Rock, the Transport Manager for the City Council, in an interview with a "JOURNAL" representative, stated that a gas filling station was being built at the Corporation gas-works at Bracebridge, and was expected to be ready within a fortnight. It would be the first municipally-owned gas filling station in the country. A Corporation 'bus would be fitted with cylinders, and tests would be made on ordinary service.

Mr. Rock has already visited towns where gas-driven 'buses are on trial, and he is convinced that there is a future for gas-propelled vehicles. The conversion from petrol to gas, he has calculated, would save more than one-third in fuel charges, and the cost of converting the present 'buses (from £50 to £100 per 'bus), he considers, would be more than covered by the saving on the first year's running.

It did not take any longer to re-charge with gas than with petrol, he stated, and the only difficulty at present was that 65 miles was the limit that a 'bus could travel on one charge. With only one filling station, therefore, delay might occur.

"I feel certain that within a few years' time," he declared, "gas filling stations will be as numerous on the roads as petrol filling stations are to-day. Another point is that our streets would be much cleaner with the use of gas instead of petrol. On a recent experimental run I failed to find any smell or obnoxious fumes of any description."

The Engineer and Manager of the Lincoln Corporation gas undertaking (Mr. Geo. Wright) remarked that this development was only in its infancy; but it had come to stay. "If Lincoln Corporation 'buses," he said, "were run on gas we should use at least another 5000 tons of coal each year at the Bracebridge works. If all motor vehicles, privately owned or otherwise, were converted to gas it would restore prosperity to all our mining areas."

Special Travelling Concessions for the B.I.F.

Twenty-Two Countries Included.

European buyers are showing more interest in British goods than they have done for several years past. This fact is indicated by an announcement from the Department of Overseas Trade which lists twenty-two countries granting special travelling concessions to encourage attendance by their buyers at the 1934 British Industries Fair, opening on Feb. 19.

Railway administrations in all these countries have agreed to offer reductions ranging from 10% to 33⅓% on return tickets to London and Birmingham in connection with the Fair. Shipping and air services are also offering substantial reductions.

"This is a most encouraging development," the Director of the Fair said in an interview. "The readiness of Continental railway administrations to co-operate in this way is a very practical tribute to the growing importance of the Fair in the eyes of overseas' buyers as well as to their increased disposition to buy British goods."

Layout of a Swedish Gas-Works

[*From "West's Gas."*

An air view of the Gas-Works of the Stockholm Corporation Gas Department, with the "Skaergaard" beyond.

COMPLETE GASIFICATION

SEVEN YEARS' SUCCESS AT MILL HILL

Five years ago we inspected, at the works of the North Middlesex Gas Company, a complete gasification plant which interested us very much indeed, and which, we felt sure, would fully justify its installation. Our expectations have been realized; and thanks to the courtesy of Mr. L. Trewby, Engineer and Manager to the Company, we were able a few days ago to visit his works at Mill Hill, where, under the guidance of Mr. F. J. Pearce, we saw what improvements have been effected during the past five years and how the system has been extended.

The plant, which is by Messrs. Humphreys & Glasgow, Ltd., is an excellent piece of engineering. It is designed for the gasification of caking gas coals or coke, and any mixture of coal and coke, and for subsequent enrichment of the gas with oil as may be required. It consists of a generator with superimposed carbonizing chamber of simple and substantial construction, and carburettor and superheater of the H. & G. standard design. A main washer is provided at the outlet of the superheater as in the standard carburetted water gas plant, and an auxiliary washer at the gas outlet at the top of the carbonizing chamber.

The blow takes place through the coke in the lower part of the generator or water gas zone, and the blow gases are led off by way of an annulus surrounding the generator and passed into the carburettor. The blow gases are burnt in the carburettor with secondary air, and their available heat is stored in the checker work of the carburettor and superheater, and afterwards utilized partly to assist in the carbonization of the coal by transference back to the generator and partly for gasifying enriching oil as required.

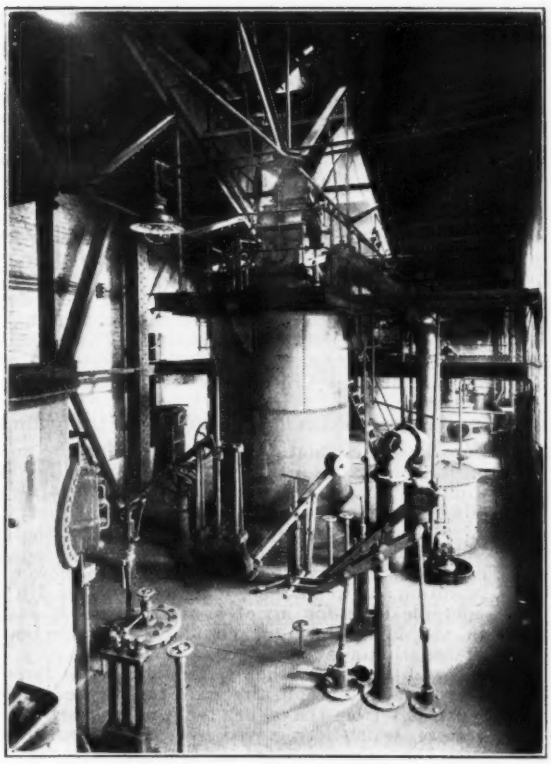
During part of the run the coal in the upper part of the generator is carbonized by the sensible heat of the water gas resulting from a modified back-run produced by admitting steam to the superheater top and leading the superheated steam into the generator base; and in another part of the run by the sensible heat of the water gas producer from an up-run with a steam not so superheated.

As the sensible heat of the produced water gas is not by itself sufficient to carbonize the coal, additional heat is transferred from the carburettor and superheater by circulating some of the gas produced during the back-run, while admitting the usual back-run steam, which is in turn superheated with it. In the Mill Hill plant the energy of the back-run gas-making steam itself, in expanding down to plant pressure, is utilized in a specially designed injector to effect the circulation of the back-run gas. We shall refer to this later.

By simple adjustment of the amount of circulated gas the necessary control of the temperature of carbonization is obtained and also complete carbonization of the coal, ensuring a properly coked residue for use in the water gas zone.

During the time the fixing vessels are not being utilized for superheating the back-run steam and its circulated gas, they are used for effecting the necessary enrichment with oil, to the degree required.

The plant can be changed over from coal to coke or *vice versa* with ease, and, on coke, working is similar to the H. & G. carburetted water gas set, with the additional efficiency due to the preheating, by the sensible heat of the back-run water gas, of the coke in the upper part of the generator or carbonizing chamber. Caking coals of the type normally carbonized in the gas-works can be efficiently and easily handled by the plant. The North Middlesex units have been working almost entirely on standard gas coals from the South Yorkshire fields, and from time to time Durham coal has been used. The advantage of being able to utilize in the plant the gas-making coals normally provided is obvious.



H. & G. Complete Gasification Plant.

A gaseous thermal yield of 180 therms per ton of coal gasified is obtainable.

The Units at Mill Hill.

After preliminary experimental working the first H. & G. complete gasification set—described in the "Journal" for March 13, 1929—was put to work on coal at the beginning of 1926 and the second and larger set was put to work in November, 1929.

Since the first set was put to work an increasing proportion of the works' output has been supplied by the complete gasification plant, until, by the winter of 1930-31, during the six months of October-March, half the total gas sent out by the Company was produced by the two complete gasification sets. In this period some 3570 tons of coal was gasified. During the corresponding period last winter 4654 tons of coal was gasified in the two sets.

The total coal gasified to November, 1933, in both sets is 25,560 tons, equivalent to 1,354,680,000 c.ft. of gas made, without taking into account the gas made from oil during the carburetting process. It also does not include gas made from coke, which has been used in the same plant at times during the summer months.

Maintenance.

As regards the coal gas portion of the plant, no repairs whatsoever have been carried out to the brickwork of the carbonizing chambers of either set.

On No. 1 set which was first put to work at the end of 1925, the brickwork of the carbonizing chamber had not been touched until the spring of 1932, when certain reconstruction work was carried out to the lower part of the carbonizing chamber for the purpose of adapting this set for tar cracking. The brickwork was then found to be in excellent shape, no appreciable wear at the joints or on the surface of the bricks being discernible. It was considered that the whole of this brickwork would have been good for another three or five years. The cost of replacing the simple lining blocks used for the carbonizing chamber is quite small.

As regards other maintenance costs chargeable to the coal gas portion of the plant, the only work carried out has been the renewal of two or three valve discs and one valve body on the older set, together with the periodical cleaning

and grinding-in of the operating gas valves of the sets and re-packing of the steam working cocks. It will thus be seen that the cost of repairs will be practically negligible.

On the water gas portion of the complete gasification sets the repairs and maintenance charges have been found to be no more than is usual. In fact, regarding the generator relining, it has been found that a considerably longer life is obtained from the brickwork, due mainly to the easier and less frequent clinkering of this type of plant.

Improvements.

Since the first set was installed, as a result of close study of the working and of the particular conditions of the process various improvements have been made from time to time and these have been added to the earlier set and were incorporated in the design of the second set. During this work the Company and Mr. Pearce placed all available facilities at the disposal of the engineers of Messrs. Humphreys & Glasgow—an excellent example of the merits of collaboration.

Among the experiments may be mentioned the following:

(1) Motorless re-circulation of gas, in which the energy of part of the gas-making steam, in expanding down from the usual boiler pressure, is utilized in a specially designed injector to produce the necessary re-circulation of gas for the carbonization of the coal. This displaced the motor driven centrifugal fans first used, and not only cut out this additional power consumption but replaced a machine which had a considerable item for maintenance charges against it. In the latest form of circulator no maintenance charge whatever is involved.

(2) The addition of another washer of special form enables practically all the coal tar to be collected separately from the oil gas tar from the carburetting process, which is removed by special arrangements from the main washer of the plant.

(3) An improved form of coal charging apparatus for measuring and delivering to the set a definite charge of coal without interruption of gas-making. The measuring of the coal charge, its introduction into the charging hopper, and its charging into the generator are performed by the operation of one wheel.

(4) Structural improvements to the carbonizing chamber, whereby a better penetration of the heating gases carbonizing the coal is obtained, so that a more uniform carbonization results. This is particularly advantageous when carbonizing fine coals which pack densely in the carbonizing chamber, and it enables high rates of throughput to be obtained.

Tar Cracking.

Recently some interesting experiments have been carried out on the cracking of tar in one of the complete gasification sets. Originally the experiment was considered with a view to cracking all the tar produced by the set—in fact, with a view to making the complete gasification process everything its name implies.

Simultaneously with this, experiments proceeded with the cracking of tar on the carburetted water gas plants of the Company, and an improved process has been developed whereby either carburetted water gas tar or coal tar, or a mixture of both, can be efficiently cracked without trouble or nuisance from lamp black deposits or the production of pitch.

It has been found possible to convert into gas considerably more tar than is produced by the process, and up to 1 gallon per 1000 c.ft. of gas made has been dealt with. A saving of from 8 to 10 lbs. of coke and an enrichment effect of from 20 to 30 B.Th.U. per gallon of tar, depending upon the quality of the tar, are obtained, and the whole of the hydrogen in the tar is accounted for in the enrichment effect produced.

Last year the Company cracked 170,000 gallons of tar and reduced the quantity of gas oil used by some 59,000 gallons.

Results.

Owing to the difficulty of isolating the complete gasification sets at North Middlesex and of working such large units without carburetting for a period sufficiently long to carry out a satisfactory test, such tests are necessarily few and far between. The most recent test at North Middlesex was made in 1930, in conjunction with Dr. H. G. Colman, for a period of three days without oil, in which a yield of 182·8 therms per ton was obtained. The results of this test are as follows:

Period of Test, May 27-30, 1930.

[Coal Used, Rothervale (South Yorkshire) Gas Nuts.]

Duration of test, hours	72
Make per 24 hours, c.ft.	692,500
Coal throughput per day (dry coal), tons	12·9
Gas made per ton of dry coal, c.ft.	53,720
Average calorific value of gas made, B.Th.U. per c.ft.	340
Therms per ton of dry coal	182·8

Somewhat better results have been obtained with good class Durham coals with a similar complete gasification plant, but automatically-operated, at Monaco. In a series of tests carried out with Londonderry coal and without oil carburation a yield of up to 208 therms per ton was obtained, with a calorific value of from 340 to 346 B.Th.U. per c.ft.

Readers will also be interested to know that an installation comprising two self-clinkering and automatically-operated complete gasification plants with waste-heat boilers is under construction, and it is anticipated that with these still better results will be obtained.

Road Tar and Safety

Work of the B.R.T.A.

Gas undertakings were well represented at a luncheon given by the South Wales Board of the British Road Tar Association on Thursday, Nov. 23, at the Park Hotel, Cardiff, in connection with the Engineering Exhibition now being held in that city under the auspices of the South Wales Institute of Engineers.

Mr. H. D. Madden, the Engineer and Manager of the Cardiff Gas Light and Coke Company, presided, and those present included Mr. Reginald G. Clarry, M.P., Chairman of the British Road Tar Association; Mr. D. Morgan Rees, J.P., President of the South Wales Institute of Engineers; Mr. Lawrence G. Williams, Chairman of the Cardiff Gas Light and Coke Company; Mr. James Miles, J.P., Mr. William Ware, J.P., Mr. Bertrand Turnbull (Directors), and Mr. R. J. Auckland (Secretary), Cardiff Gas Light and Coke Company; Mr. J. H. Canning, O.B.E., Engineer and Manager, Newport Gas Company; Mr. I. G. Jenkins (President) and Mr. Octavius Thomas (Secretary), Wales and Monmouthshire Association of Gas Engineers and Managers, and Mr. W. E. Cone, Technical Adviser, British Road Tar Association.

In the course of the proceedings some reference was made to an experimental road in Cathays Terrace nearby, the surface of which was dressed with refined tar supplied by South Wales members of the Association. By the courtesy of Mr. G. H. Whitaker, Engineer and Surveyor to the Cardiff Corporation, this was open for inspection, and those present were invited to examine it.

Mr. D. Morgan Rees, giving the toast of "Prosperity to the Trade of South Wales," said it was obvious that the depression had reached rock bottom, and that trade was now on the rebound. While South Wales might not be showing any particular improvement there was a very decided revival, particularly in the steel trade, and improvement in the coal industry was bound to follow.

The Deputy-Lord Mayor (Councillor James Griffiths) responded.

Mr. H. D. Madden, in proposing the toast of "Our Guests," referred to the representative nature of the gathering. They had with them, he said, the Chairmen of Road Committees of County and Borough Councils, quarry owners, and tar users generally—in fact, all those who were interested in the making and maintenance of roads—together with the managers of gas undertakings which produced the tar used by members of the Association throughout South Wales and Monmouthshire. There were also present representatives of the "Back-to-Coal" movement, and he coupled with the toast the name of Mr. Trevor M. Williams, Joint Hon. Secretary, who responded.

A 100% British Product.

Mr. D. Rupert Phillips gave the principal toast, that of "The British Road Tar Association." He was happy to do so, he said, as the Association represented a 100% British product. It was representative of all gas undertakings and coke ovens in this country. The Gas Industry alone carbonized 18 million tons

of coal per annum, and the coke ovens some 15 million tons. The objects of the Association were to encourage and develop the use of tar and tar products for road and other purposes. It was formed in 1927 as a result of the Joint Tar Committee which was set up in 1924, and to-day it had a membership bordering on 800 companies and undertakings. They wanted to see this figure increased. Its main object was to improve the quality of tar by research, and to give publicity to the use of British material, an object never more necessary than to-day. Owing to the extended use of tar their main roads were now absolutely dust-proof. But even then there were two kinds of roads—one with the skiddy surface—a veritable death trap in wet weather—the other with the non-skid surface. The latter was made from British tar, which in turn was a product of British coal. He could not understand an authority deciding to use on its roads any material which would give a skiddy surface, or any authority using any other material when it could obtain road tar made from British coal, especially if such authority had within its boundaries collieries producing coal from which such tar could be made. The Association had no interest in the prices quoted; it simply had as its object the production of a perfect road surface. It did not appeal to the public for support simply on the ground of supporting home industries; it took its stand definitely on the statement that its product was vastly superior in every way to road surfaces manufactured from foreign oil. There could be no more honest statement than that of Sir David Milne-Watson when he said: "We want the confidence of our customers, and we are doing our utmost within the limits of the funds at our disposal to merit it. . . . To those firms that are not subscribing to our funds I should like to say that it is my considered opinion that they should no longer stand aside in a matter in which they are so vitally interested. The Association has more than justified itself, and I am convinced that it will continue to do so in the future." Everyone who knew the work of the Association would cordially endorse what Sir David Milne-Watson had said, and they who lived in that district should do everything in their power to further its aims. The highways of this country represented a total of about 180,000 miles, and tar could well be used on every mile. The number of mechanical vehicles using the roads was increasing to an alarming extent. If for no other reason, every factor that made for road safety should be considered by those in authority. Every order for British tar meant extra employment in the mines. In conclusion, Mr. Phillips paid a high tribute to the services rendered by Mr. Madden and Mr. Octavius Thomas.

Mr. Reginald Clarry, M.P., responding, congratulated the Chairman of the local Board of the Association on his enterprise in bringing together such a large number of those interested in the production and use of tar. Nothing but good could come from such a gathering. The British Road Tar Association was a non-trading body, out to develop the production of tar from coal on lines that would prove profitable to all concerned. The product to-day was far more efficient than ever it was, and this enabled it to be used to a larger extent for the same expenditure as when it had been used on a more limited scale. Mr. Clarry described the road in Cathays Terrace, which the company had been invited to inspect, as an excellent example of a non-skid tarred road, and said that what had been done there could be done elsewhere.

Visit to Exhibition.

After the luncheon the company visited the Engineering Exhibition in the Greyfriars Hall nearby, where they were received by Mr. D. Morgan Rees, President of the Institute of Engineers.

A few words of welcome by Mr. Morgan Rees were acknowledged by Mr. H. D. Madden, and by Mr. I. G. Jenkins, President of the Wales and Monmouthshire Association of Gas Engineers and Managers, who was accompanied by Mr. Octavius Thomas, Secretary.

The company then proceeded to inspect the exhibits, and of course were particularly interested in the Association stand, where there was a large sized photograph of the experimental road in Cathays Terrace, already referred to. Over the stand were the words in huge letters: "The Shortest Distance Between Two Points is on a Non-skid British Tarred Road."

The visitors also showed keen interest in the exhibit made by the Cardiff Gas Industrial Research Department of the Cardiff Gas Light and Coke Company, which comprises typical equipment. It includes a Brayshaw Lopress furnace suitable for general heat-treatment work; one pair of tin-plate hot rolls fitted with specially designed pre-heating arrangement for gas-firing the mill rolls prior to working. The stand is a valuable information bureau for manufacturers in the area of all the undertakings affiliated to this sectional research centre. The undertakings associated with it are: Abertillery, Carmarthen, Chepstow, Dowlais, Llanelly, Neath, Newport, Gowerton, Monmouth, Pontypool, Port Talbot, Rhymney and Aber, Tredegar, and Tawe Valley.

Other Exhibits.

Among the other exhibits at this Exhibition are many of direct and indirect interest to the Gas Industry, including displays by the following firms and institutions: The British Road Tar Association, the Bromford Tube Company, Ltd., Davey, Paxman, & Co., Ltd., the Department of Scientific and Industrial Research, whose exhibit gives particulars of the successful application of steaming to a setting of horizontal retorts; George Kent, Ltd.; Simon-Carves, Ltd.; Stewarts & Lloyds, Ltd.; John Thompson (Wolverhampton), Ltd., and the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd.

NOTES ON PLANT AND PROCESSES

"Thermidair" Central Heating.

A problem which is receiving increasing attention is the heating of rooms which are only occupied for a proportion of each day. School class rooms, for example, are often in use for fewer than 40 hours per week, but in order that a suitable temperature should be maintained during the occupied period it has frequently been necessary to keep the heating apparatus working continuously throughout the winter period.

This continuous heating has made the use of gas for heating the boilers seem unduly expensive although the ease of control and regulation of gas-fired installations renders them particularly suited for the heating of rooms only intermittently in use. But although the advantages of flexibility in gas heated systems have been generally recognized, the full superiority of such systems is only to be realized if the radiators themselves are almost instantly responsive to the temperature requirements of the rooms to be heated.

"Thermidair" convectors, manufactured by Messrs. Midland Metal Diecasting, Ltd., of Wolverhampton, are claimed by the makers fully to satisfy these conditions. Constructed of copper and aluminium, their weight is on average one-twentieth of that of cast-iron radiators, and the volume to be heated in each convector is very much less than that of even the smallest radiator of the ordinary style. As a result, where steam is used for heating, "Thermidair" convectors are almost instantly heated, and the interior of the room raised to the desired temperature with a minimum of delay.

As an additional advantage, "Thermidair" convectors assure ideal comfort to the occupants while satisfying all the decorative requirements of the building.

The convectors, fitted with Westinghouse thermostats, and connected to systems where gas-heated boilers for heating by steam are employed, provide a system of heating suited for installations of all types.

Modern Gas Fires.

Pursuing their progressive policy, proof of which has been evidenced on many occasions in these columns, Messrs. Falk, Stadelmann, & Co., Ltd., of Veritas House, Farringdon Road, E.C. 1, have introduced several features of outstanding interest in their range of gas fires for the coming season, in connection with which they have just published an attractive catalogue, containing many illustrations in actual colours.

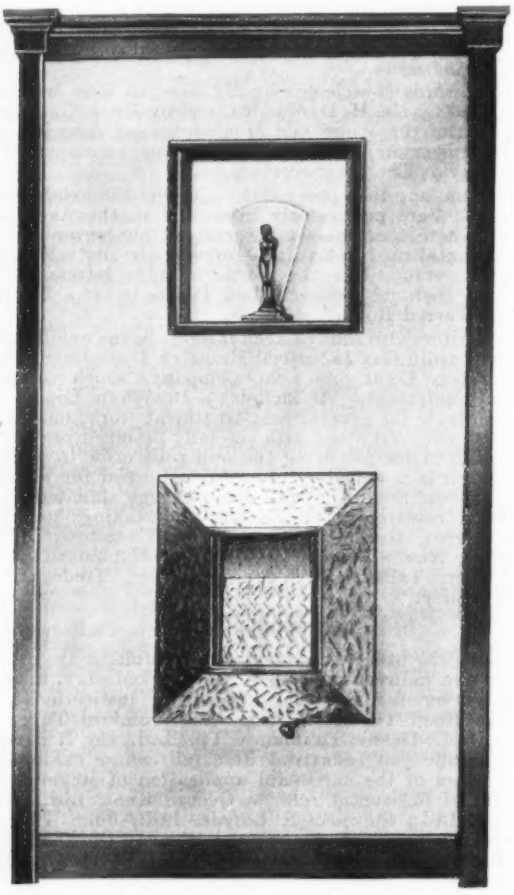
Among the important advances made may be mentioned the fact that they are now supplying gas fires in a wide range of coloured paint finishes at the same price as black, thus catering for the present vogue for colour in the home without affecting the initial outlay. The new finish embodying "marble" veining is very pleasing, the basic colours being brown, red, blue, and green, giving a dignified effect which is capable of harmonizing with many modern mantel surrounds. The finish of the firm's oxidized silver and copper, in addition to gold and black, fires has also been greatly improved.

The "Keyfit" Inset Fire.

The most outstanding feature, however, of Messrs. Falk, Stadelmann's gas fire programme is undoubtedly their new "Keyfit" inset fire; and a recent visit to the firm's very fine showrooms at Veritas House—where examples of the appliance are shown in modernistic settings—enables us to bear testimony to its very tasteful appearance, and, indeed, to that of many other gas appliances we had the opportunity of seeing displayed there.

The keynote of this fire is its simplicity. It fits in a wall

recess 12½ in. wide by 22 in. high by 7 in. deep, and its neat cadmium-plated or artistic coloured frame lends itself to harmonizing with any modern furnishing or decorative scheme. An important point is that, should the scheme of decoration be changed, the whole frame can with the ut-



Falk, Stadelmann's "Keyfit" Inset Gas Fire in an Up-to-Date Setting.

most ease be slipped off and another substituted without the necessity of removing the whole fire. The frame is cooled by air induction through openings provided for this purpose at the bottom.

A new type of radiant is used with the "Keyfit" fire, which dispenses with the necessity for a bar in front to prevent it falling forward, thus enhancing the appearance of the fire. The top of the radiant is stepped back and fits under a projection made in the back brick, rendering fixing and removal a simple matter. The design is based on the new "Silo" step radiant which presents an unbroken surface of heat. Although there are no visible slots or apertures, the radiant is fully ventilated by a series of openings arranged in sloping steps. Our photograph shows an attractive treatment of the "Keyfit" fire in a modern setting.

The "Silo" Gas Fire Lighter.

Messrs. Falk, Stadelmann have in the past devoted attention to the lighting of gas fires without the use of matches, and their new "Silo" lighter has advanced the matter a

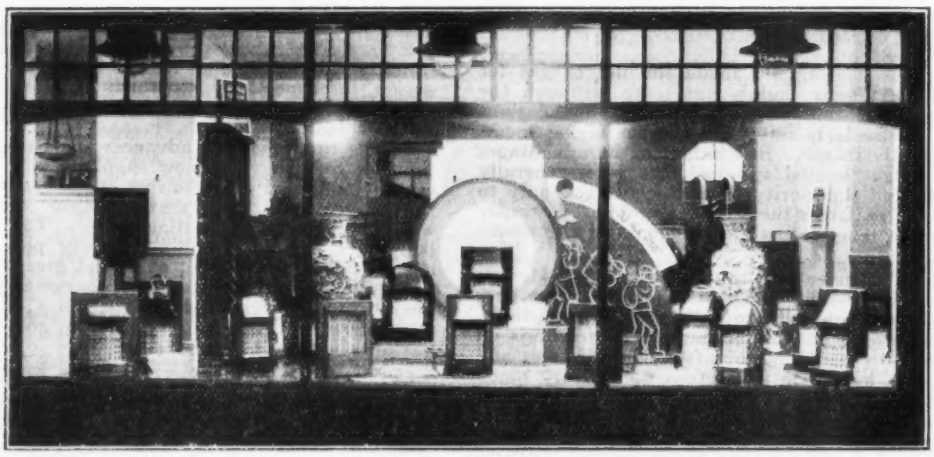
The "Silo" Automatic Gas Fire Lighter.

further stage towards perfection. The device, which is fitted to an extension of the supply pipe beside the fire, has a "gun" action, and is operated merely by turning a button to the right. (It can only turn one way, so mistakes are impossible.)

This movement opens, ignites, and closes the pilot jet, at the same time lighting the fire, in one operation after opening the main tap. There is nothing to go wrong and the only attention required is occasional renewal of the flint. This is a simple process by merely releasing a screw and dropping a new flint in on top of the old one, which will then be completely used up.

The firm's new catalogue deals in detail with the foregoing, in addition to many other gas heating appliances.

A Gas Fire Display at Minehead



This photograph, taken by Mr. A. Vowles, Photographer, Minehead, is of a gas fire display in one of the showroom windows of the Minehead Gas-Light and Coke Company, Ltd. The display was put in for entry in the Shop Window Competition in the Alcombe and Minehead Carnival. The background consists of a Radiation gas grate display. The photograph was taken at night, the lighting consisting of a Sugg ventilating lamp, two inverted bowl fittings, and two wall panel lights.

NEW "SERVICE CENTRE" FOR CROYDON COMPANY

Attractive Showroom Premises to Cater for Rapidly-Growing Addiscombe Area

EXTERIOR VIEW OF THE CROYDON COMPANY'S NEW SHOWROOMS AT ADDISCOMBE.

The Croydon Gas Company, ever on the alert to render better service facilities to the outlying portions of their area of supply, have recently completed very fine new showroom premises in the rapidly expanding district of Addiscombe—a district which during the last few years has become a popular residential area and a busy shopping centre.

The Company have secured an admirable corner site in the heart of this shopping area, on the Lower Addiscombe Road, the main thoroughfare approaching Croydon from the east, and Mr. A. Douglas Robinson, F.R.I.B.A., the Architect, has succeeded in evolving a building fully in keeping with the Croydon Company's high traditions. The building is set back some distance from the original frontage line, and a wide footway in front enhances the appearance of the premises, with their large window area and a pleasing finish of green setting off the stonework. Outside gas lamps efficiently throw the fascia into prominence at night.

The Interior.

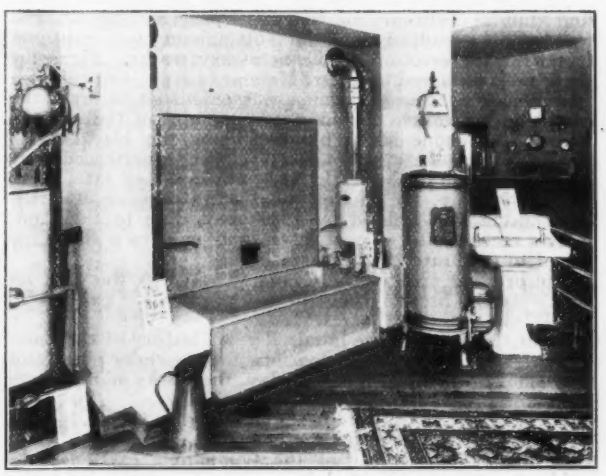
The main entrance is from a stone porch on the corner of the building, and on entering one is faced with the counter at the far end of the showroom, while the appliances are tastefully arranged around on either side. The interior colour scheme is of primrose yellow and green, the floor being of Australian jarrah wood. Particularly attractive are the stone fireplaces showing examples of coke and gas fires, illustrating how perfectly the gas fire harmonizes with such a setting.

A wide variety of up-to-date gas apparatus is, of course, to be seen, all either already connected up or capable of being quickly connected by flexible tubing to handy gas points. It is interesting to note that all the gas fires have concealed supplies and are operated by taps beneath little brass trapdoors set flush with the floor beside the appliances. Such an arrangement adds considerably to the general appearance of the setting.

Comprehensive Hot Water Section.

The hot water section is very comprehensive, many types of modern instantaneous and storage heaters being shown at work. For instance, a bath is arranged to receive hot water from six separate and distinct heating installations

A Section of the Interior of the Croydon Company's Addiscombe Showrooms, showing Attractive Furnishing and Layout.



A Portion of the Water Heating Display at the Addiscombe Showrooms, showing Bath Fed by Six Separate Hot Water Supplies.

namely—two geysers in different finishes set one at each end, while four taps—all appropriately labelled " hot "—supply from a multi-point heater (which, by the way, also feeds a sink in another part of the showroom), two large storage heaters, and a gas boiler.

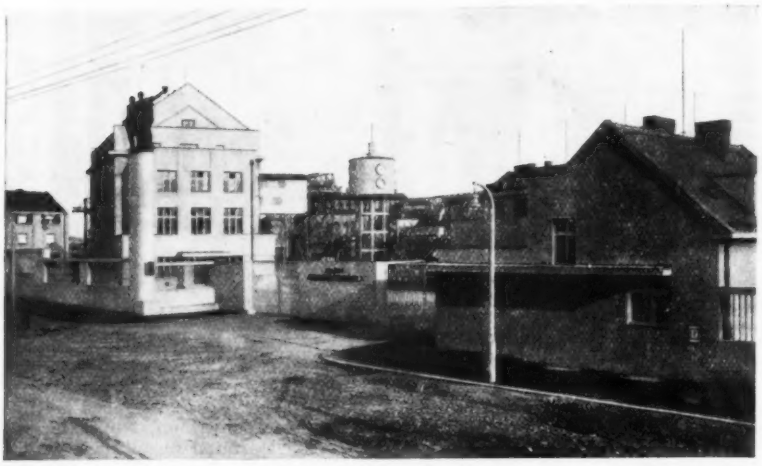
Alternative tiled kitchen recesses are shown, in the one case containing cooker, gas boiler, and gas fire all harmonizing in grey mottled enamel finish; and in the other case containing cooker and coke boiler, also in mottled finish, the cooker being fitted with the new " gas match " and the coke boiler complete with gas poker. A further wide range of cookers of various types is displayed.

Pleasing Lighting.

The lighting of the interior is very pleasing, a large number of attractive fittings being in operation, many of them controlled by switches. These fittings include ceiling bowls and pendants, wall brackets, and " candle " brackets. It may be mentioned that the wide " open " windows allow of practical demonstrations which are a feature of the Croydon Company's policy. A further " homely " touch is added to the showroom by the very tasteful furnishing of the interior, the attractive pictures adorning the walls, and the pieces of old brass and pewter ornamenting the mantelpieces and niches—little things, perhaps, in themselves, but all showing a completeness and attention to detail which pleases the eye and makes all the difference to the final effect.

Behind the showroom are situated the resident inspector's office and a small store room to serve the general requirements of the district, while there is useful yard space at the back. On the floor above is the inspector's flat. A continuation of the building, beyond the needs of the showroom, the Company will let as lock-up shops, while above these are further flats.

Altogether the Croydon Company are to be congratulated on the erection of a building which not only enhances the appearance of the thoroughfare on which it stands, but also gives further proof—if such be necessary—of the Company's earnest endeavour to render the best possible service to their consumers in a district hitherto somewhat remote from a gas showroom.



[*From " West's Gas."*

THE MAIN ENTRANCE TO THE MICHLE GAS-WORKS OF THE PRAGUE MUNICIPALITY.

According to Eng. K. Jedlicka, Director of the Prague Municipal Gas-Works, at Prague in recent years propaganda has doubled the number of consumers.

Bridging a Century

A Hundred Years of Gas in Grantham

Early in the year 1833, a number of prominent Grantham men met in the Guildhall, and decided to form a Company whose object would be " to manufacture and produce inflammable air or gas from coal, oil, or other materials " for the purpose of lighting the town of Grantham and adjacent hamlets.

No time appears to have been lost in the matter, for we find that in February of the same year a piece of land was purchased adjacent to the Nottingham and Grantham Canal for the erection of the necessary works. Plans for these were prepared by a Mr. Malam, of Hull, and the firm represented by this gentleman was entrusted to erect the complete gas-works. Nothing now remains of the original works except one small building, now the blacksmith's shop. No trouble appears to have been experienced during the erection of the works and mains; at any rate, there was little delay, for on Oct. 30, 1833, a number of street lamps were first lighted by gas. According to the Company's records, the sum of £2 2s. was paid to a Band engaged to celebrate the occasion.

The original area of the Company's Works was half an acre. At the present time the works property extends to nearly six-and-a-half acres.

Right through the one hundred years history of the Company developments and extensions to the works plant and mains have taken place, and to-day, the works manufacturing plant is entirely modern.

The original capital of the Company was £6000; to-day, the capital is £121,068 10s.

During the first year of the Company's existence, 71 public lamps were lighted by gas in Grantham and the hamlets of Spitalgate and Little Gonerby. At the present time there are 539 street lamps in the town, 13 in Barrowby, one in Great Gonerby, all gas-lit and automatically controlled. At the end of 1833 there were two miles of gas mains; now, in 1933, there are 25 miles. In 1837 there were 185 gas-consumers; to-day there are 6100.

The total gas made in the first complete year of the Company's history was 3 million c.ft.; forty years later it had reached 27 million c.ft. Sixty years later, in 1894, it had reached 69 million c.ft., and in 1932 the gas made reached the figure of 148 million c.ft.

At the invitation of the Chairman and Directors, a company of over sixty representatives of the Corporation and the various professional, commercial, industrial, and trade interests, including the Urban Electric Light Supply Company and the Mid-Lincolnshire Electricity Company, and gas engineers from nearby towns, attended the centenary commemoration dinner at the George Hotel, the chair being taken by Dr. Shipman, who was supported by the Mayor (Alderman F. Weekley), Mr. Frank H. Jones, M.Inst.C.E., Mr. R. G. Shadbolt, M.Inst.G.E., who was with the Grantham Gas Company from 1895 to 1929, first as Engineer and Manager and latterly as Consulting Engineer), Alderman Rothwell Lee, and others. The following Gas Engineers were present: Mr. G. Dixon (Nottingham), Mr. W. C. Chapman (Boston), Mr. S. Hands (Sleaford), and Mr. B. Clarke (Stamford), together with Mr. J. E. Young (local Manager), and Mr. H. J. Jarman (Secretary).

The Chairman proposed the toast of " Our Founders," and outlined the history and progress of the Company. The toast of " The Grantham Gas Company " was proposed by Mr. Frank H. Jones, who remarked that in terms of human life 100 years ago was a long time, but in the history of that Company he would rather think of it as their coming-of-age.

100 Years of Gas in Dorchester

Tuesday, Nov. 7, was the centenary of the Dorchester Gas and Coke Company. On that date, in the year 1833, gas lighting was seen in Dorchester for the first time, and the *Dorset County Chronicle*, in its issue of that week, has the following record of it:

> "*Gas.*—One of the greatest improvements ever effected in this town was consummated on Thursday evening last, when the gas-works were first put into operation. This event, which has been looked forward to with great anxiety, has more than realized the most sanguine hopes of the advocates of the measure; and on the lamps in the public streets, in the shops, and private houses being lighted, a blaze of brilliancy was cast over the town to which it has hitherto been an utter stranger. The stigma which had long lain upon Dorchester, for the hitherto feeble glimmer of its public lights, which served but to make 'darkness visible,' has now been removed; and the lamps being placed more closely together than in almost every other town that has availed itself of this useful discovery, and the gas being found to be of a superior brilliancy and purity, our town may now vie in this respect, with any of its size in the kingdom. This improvement was particularly desirable in a town which, like Dorchester, is a thoroughfare; and the accommodation consequently afforded to travellers is very great. We observe that nearly all the shops in the town are lighted by this excellent method, and although there are a few exceptions, yet we doubt not that, when time shall have proved the safety attendant upon the adoption of the Company's regulations, and the experience of others shall have shown the economy of the light, any prejudice yet remaining will be entirely swept away."

The history of the Dorchester Gas and Coke Company is in a sense the commercial history of Dorchester, in which it has played so big a part in the past 100 years. The Company's oldest document, its "Deed of Settlement," was printed in 1833.

The works had been erected on the site they occupy to-day in Icen Way, and Mr. Bennet Harvey was both Manager and Clerk to the concern. In its first trading year the Company was selling gas at 15s. per 1000 c.ft., but a reduction of 2s. 6d. was made in the following year when there was a division of profits to the amount of £150, being a dividend of 5% on the original capital. Two years later the gross revenue for the year was £908 12s. 8d., and the report, signed as it was then by eight Directors, decided that the charge for public lamps should be increased, the actual cost to the Company being nearly double the remuneration. Mr. Prince had become the Company's Clerk and Superintendent at a salary of £25 per annum. In 1843 the price of gas was reduced to 10s. per 1000 c.ft., "conveying the same to the consumer's house free of cost and providing the fittings at cost price." At no period since the formation of the Company had the concern been in a more flourishing condition, and the salary of the Clerk and Superintendent (Mr. Edward Billows) was raised to £80 and in the year following to £100.

The year 1846 was an even better trading period, and there was one very distinguished new customer. Gas was laid on to the county gaol, and the report adds "Your Directors have been applied to by the Southampton and Dorchester Railway to supply their Dorchester terminus with gas." Fifteen years after the works were opened there came a new tank and gasholder, on which the sum of £1679 10s. 1d. was expended. The capital of the undertaking was increased to £7000; the consumption of gas reached 3,000,000 c.ft. to private consumers alone. Half-yearly general meetings were established in 1859, and a dividend of 8% was declared.

The 'sixties witnessed the provision of another gasholder capable of containing 60,000 to 80,000 c.ft. of gas, at a cost of £2000, and gas was reduced to 5s. per 1000. Early in the 'seventies the Directors declared a bonus of 25s. per share, and increased the capital to £10,200, and the gratifying report appeared that "all the public buildings and institutions (except the Union) are supplied by the Company." In 1874 the balance of the mortgage debt (£750) was paid off, and a dividend of £7 10s.% was declared. These were very prosperous years in the 'seventies, and although land was purchased for the erection of new purifiers and a new house for the Manager, the dividend rose to 10% and the gas price was brought down to 4s. 2d.

Another important stage in the Company's history was reached in 1878, when it was registered as a limited liability company under the Joint Stock Companies Act, and the capital was re-adjusted, the share certificates called in, and the £30 and £7 10s. shares became merged into 1700 shares of £10 each, all paid up. The Chairman of the Board at this time was Mr. Henry Lock, the grandfather of one of the present Directors, Mr. Giles Symonds was the Secretary, and Mr. William Osmond the Manager. £5000 further capital was raised, bringing the capital account to £22,000, so that in 1881 there was a sum of £17,000 in original shares and £5000 in preference shares.

The Advent of Electricity.

But a new competitor was coming into the field of lighting, and in the Directors' report for Aug. 8, 1882, it was declared that "notwithstanding all that has been written and said about electricity, gas companies have no reason to fear that it will cause any permanent injury to their property." About the same time the proposal was made to the Company for the first time—it was a development that the Directors "toyed" with for a good many years afterwards—that the mains should be carried to Charminster, which, it was stated, would then require a further outlay of from £700 to £800. What the Directors did do that year, however, was to raise the dividend to £11% and to fix their Directors' fees at £50 per annum.

Attention was called to the fact early in the 'eighties that 50 years had passed since the Company first commenced operations. The consumption of gas for the year was in the neighbourhood of 20,000,000 c.ft., and the Company gave a most spectacular demonstration of the practical ability of gas for lighting and heating by holding a successful exhibition, which was carried out under the direction of Mr. Osmond, the father of the present Manager and Secretary.

Substantial dividends continued to be paid although gas became periodically cheaper to the consumer, but in 1887 there were the earliest rumblings of coming disturbances in the industrial world, when the price of coal went up owing to a strike among the colliers. In 1887 Mr. Frank Osmond succeeded his father, to whose management was attributed the Company's present state of prosperity and efficiency. The erection of a new gasholder was completed in 1897, when the Directors raised fresh capital (£4000 debentures).

Public lighting was improved in 1900 by the introduction of the Welsbach incandescent system, the sulphate of ammonia plant was renewed the same year, and was followed a year or two later by a new retort house and regenerator furnaces. Mr. J. W. Fudge, the present Chairman of the Company, joined the Board in 1902, and 1904 witnessed the opening of a town office and showroom at 65, High West Street. Profits were on the upward grade, dividends of 10% and 6% were regularly paid on the ordinary and preference capital respectively, and consumers participated in the prosperity of the Company with substantial concessions in regard to the price of gas, which in 1912 stood at 3s. 4d. per thousand.

The report of the directors in January, 1913, states: "It has been announced that the electric light will be installed in Dorchester within a short period. The Directors have had this contingency in view for some time, and have made careful preparation to meet any possible competition." One reply to that was the opening of more central and commodious premises as offices and showrooms in Cornhill, which brought the products and uses of gas and the latest appliances into the great business "hub" of Dorchester, in one of the best shopping sites in the town. Even in competition with electricity the consumption of gas had increased.

In 1915 there was installed a carburetted water gas plant which proved very useful during the war years and more or less saved the situation during that difficult period.

German Prisoners Make Gas.

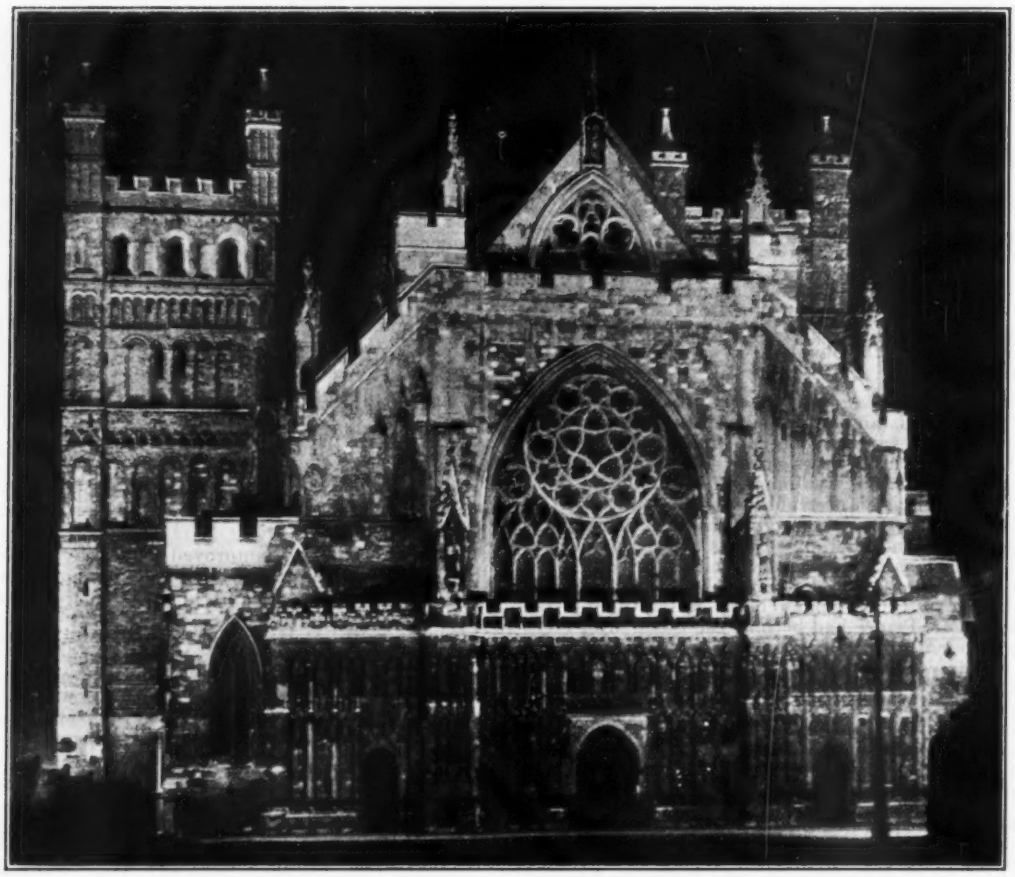
In 1916, when German prisoners were brought to the internment camp at Poundbury, a number of them were employed at the Dorchester gas-works. They were marched down each morning and marched back at night by a military guard from the Depôt.

With the more general use of gas for cooking and heat-

ing purposes the business expanded in a remarkable way, and in the second half of 1917 an increase of no less than 3,457,000 c.ft. on the corresponding period of the year before was reported.

The thermal basis, instead of cubic feet, was adopted under the Dorchester Gas (Charges) Order, 1922, which prescribed a standard price for gas of 16·6d. per therm in substitution for the pre-existing standard price of 4s. 6d. per 1000 c.ft., with a sliding scale regulating dividends on the ordinary capital. Several important additions to the works followed the war. In 1922 new exhausters, direct driven, were installed, and in 1928 the Company put in an electrical charging machine, which eased the men's labours considerably and increased the gas production. In 1926 the Directors opened new offices and showrooms, which heralded another important stage in the Company's development, the erection of an additional gasholder in 1931, as a result of which there was a record trading year, there being an increase of no less than 6,798,000 c.ft., equal to 9%. The last published return in the Company's 100 years of trading showed that the quantity of gas sold for the year was 84,109,600 c.ft. That epitomizes the position of unassailable strength and prosperity, which the Dorchester Gas and Coke Company holds to-day.

Gas Floodlighting of Exeter Cathedral



THE WEST FRONT OF EXETER CATHEDRAL FLOODLIGHTED BY GAS.

This year is the Octocentenary of the Cathedral Church of Saint Peter, Exeter, and the concluding celebrations in connection with that event have taken place during the past week, around Nov. 21, which is the date of the Consecration of the Cathedral eight hundred years ago.

The Archbishop of Canterbury was present at the services on that day, which were attended by very large congregations including the Mayor and the Sheriff of the City of Exeter, accompanied by members and officials of the Corporation and other public bodies.

About twelve months ago, when the arrangements for the celebrations of the Octocentenary were being considered, the Directors of the Exeter Gaslight and Coke Company offered to floodlight the Cathedral by gas free of charge, which offer was accepted by the Dean and Chapter. The floodlighting was spread over from Saturday night, Nov. 18, to Wednesday night, Nov. 22, inclusive, from 5 p.m. to 11 p.m. each night.

The aim of the floodlighting was not to see how much light could be concentrated on the building, but to use sufficient to bring out its architectural features, and the result has been very favourably commented on by the public and also in the Press.

More than forty lamp projectors were used, the maximum candle-power being approximately 130,000. These lamps were arranged on the Cathedral green, the Deanery wall, and also just inside the entrance to St. Mary Major's Church.

The question of supply was a serious consideration, for considerable lengths of piping had to be laid, and sections of the Cathedral paths taken up. The pipes, now buried, will be left permanently in the ground.

It is interesting to note that the supply of gas was obtained from a 4-in. main in Cathedral Close, which was laid down seventy years ago, and it is stated to be in as good condition to-day as it was when it was laid.

The Commercial Development of the Gas Industry in Great Britain*

By T. P. Ridley, F.C.I.S., Assoc.Inst.Gas E., Commercial Manager and Secretary to the Newcastle-upon-Tyne and Gateshead Gas Company.

Size and Progress.

The Gas Industry in Great Britain has a most enviable record for trustworthy public service and in magnitude is second only to the Railways among Public Utility Undertakings.

The capital employed by supply undertakings is over £180,000,000† ($900,000,000), the mileage of mains is 52,000, and the number of employees over 100,000.

The sales of gas and the number of consumers of Statutory Undertakings have developed in manner shown in Table I.

Table I.—*Showing the Development in the Sales of Gas and Numbers of Consumers by Statutory Supply Undertakings in Great Britain.*

	Gas Sold.		Numbers of Consumers.			
	Million C.Ft.	% Over 1883.	Ordinary.	Prepayment.	Total.	% Over 1883.
1	2	3	4	5	6	7
1883	68,270	..	...	..	1,979,481	..
1893	99,212	45	..	..	2,400,254	21
1903	147,702	116	(Not previously divided)		4,230,721	114
1913	201,595	195	3,247,066	3,670,681	6,917,747	249
1923	241,627	254	3,579,107	4,231,243	7,810,350	294
1931	290,692	326	4,017,232	5,584,305	9,601,537	385

The sale of gas in recent years has not progressed at the same rate as the increase in the numbers of consumers, which, in the opinion of the author, is mostly due to the facts—

(1) that the small houses constitute the largest proportion of new consumers;
(2) that by extensive building since the Great War there are fewer cases of more than one family living in one house; and
(3) that the severe trade depression which has existed, and until recently gradually deepened, during the last ten years, has necessitated economy.

Progress has also been made in manufacturing results. "Field's Analysis" (a recognized statistical record) shows that in 1913, for a group of 33 undertakings, an average make of gas per ton (2240 lbs.) of coal carbonized was 11,799 c.ft.; in 1932 the average was 14,642 c.ft., an increase of 2843 c.ft., and this with an increase in salable coke and tar per ton of coal carbonized.

Types of Undertaking.

Gas is supplied by two types of undertakings—Statutory and Non-Statutory. The former have, by Act or Order, authority from Parliament to break up roads to supply gas, and the price they may charge for gas and the dividends they may pay are regulated. Non-Statutory Undertakings open up roads with the consent of the municipalities controlling such roads. They are not limited with regard to prices which they may charge or as to the profits which they may distribute. Although 600 in number, they only supply small and sparsely populated areas, and their sales represent less than 3% of the total sales. They are therefore ignored in all figures given in this paper.

The Statutory Undertakings are divided into four classes.

A maximum price which may be charged for gas by municipalities is generally specified in the Special Act or Order, and always in the case of maximum price companies, as the name implies, and with the latter a maximum dividend which may be paid is also specified.

The sliding-scale companies' standard prices and dividends are prescribed, and for every fifth of one penny per therm or one penny (2.1 cents) per 1000 c.ft. which the price charged to the small consumer is below the standard price the dividend payable may be increased—generally by 2s. 6d. (62½ cents) beyond the standard rate and *vice versa* in the event of the charge for gas being above the standard price.

Under the basic price system a company is given a basic price (say, 1s. (25 cents) per therm) and a basic dividend (generally 5%); if it sells X therms in a year its basic revenue would be X shillings. If, however, it succeeds in selling gas at prices less than the basic (say, 8d. (16.66 cents), 9d. (18.75 cents), and 10d. (20.83 cents)), and thereby derives a revenue of Y shillings (*i.e.*, something less than X shillings) it is permitted to pay a fraction (generally one-sixth) of the difference between X shillings and Y shillings by way of addition to the basic dividend or transfer to reserve fund, and provision is made for the setting-aside of a similar sum for the benefit of the company's co-partner employees.

Table II.—*Showing Analysis of Statutory Undertakings.*

Number of Undertakings.	Owned By.	Number of Consumers.	Annual Sale.	Total.	Sales per Consumer.
1	2	3	4	5	6
				%	C.Ft.
315	Municipalities . .	3,681,547	102,668,718,000	35	27,887
186	Maximum price and dividend companies	947,513	28,550,383,000	10	30,138
227	Sliding-scale companies	2,147,385	63,142,182,000	22	32,071
21	Basic price companies	2,825,092	96,331,500,000	33	
749		9,601,537	290,692,783,000		

It will be noticed in Table II. that the consumption per consumer is greater for companies than municipalities and greater for companies with dividend incentives than for companies with maximum dividends, which generally are earned with ease.

The following analysis gives an indication of the sizes of the Statutory Undertakings:

80·0% of total number sell under 250 million c.ft. per annum
8·4% " " " over 250 and under 500 " " "
5·3% " " " " 500 " " 1000 " " "
5·3% " " " " 1000 " " 5000 " " "
1·0% " " " " 5000 " " "

In the last twenty years the desire to municipalize gas undertakings has greatly diminished.

Legislation.

In the year 1920 the South Metropolitan Company obtained a Special Act of Parliament which provided for the introduction of the basic price system (already described) in substitution for the sliding-scale. Several other large companies have since obtained similar powers until of the total gas sold 33% is by companies with basic prices. In most cases, however, a clause (known as the "Board of Trade" Clause) is inserted in Acts and Orders to the effect that no sum in excess of the basic dividend shall be paid to shareholders, the reserve fund, or co-partners, when the price charged to *any* consumer is equal to or in excess of the basic price.

The important peculiarities of the basic price system are:

1. The basic dividend is an authorized minimum dividend payable irrespective of the price charged for gas.
2. The sum payable as dividend is not dependent upon the highest price charged, but upon the average price realized (except for the clause referred to in the immediately preceding paragraph), thereby giving the shareholders the benefit of discounts and special low prices.
3. The system creates a partnership of consumers, stockholders, and employees.

The great difference between the co-partnership arrangements under the basic price principle and profit sharing, co-partnership, and other welfare funds which have been in voluntary operation for many years is that under the former the employees acquire statutory rights to a share of the profits.

Gas Rates.

Legislation has had, of course, a great effect upon the commercial development of the Gas Industry in Great

* Paper read before the Annual Convention of the American Gas Association.

† Sterling is converted into dollars at 5 dollars to £ for simplicity.

Britain. The Act of 1871, which compelled all statutory undertakers to give and continue to give supplies of gas did not protect the undertakers against uneconomic consumers. No matter how small a quantity of gas an occupier requires, the undertaking is compelled to supply. In a certain number of cases the undertakings have a standby provision in their Special Acts, but this does not give any protection to the undertakings *vis-a-vis* the small consumer. The result is that in the Newcastle Undertaking with over 200,000 consumers, 89% of its prepayment consumers consume less than 20,000 c.ft. each per *annum*, and over 50% of its domestic consumers by ordinary meters consume less than 20,000 c.ft. each per *quarter*. An analysis of costs showed that the prepayment consumers, notwithstanding the extra price charged to them in respect of the hire of gas appliances, &c., were not paying their full share of charges by over £50,000 per annum; the large domestic consumers by ordinary meters were averaging up the small ordinary domestic consumers, and the shortage on the prepayment consumers was provided by the large industrial consumer, all of which shows that the small consumer has had a great and unfair advantage. The gas undertakings have honourably met their obligations under the 1871 Act, but at great sacrifice in the development of their industrial and large-scale sales.

The regulation of dividends by the highest price charged to the small consumer has prevented British gas undertakings introducing many of the forms of tariffs common in America. It will at once be seen that if the American Block Rate with small initial block constituting minimum bills, or service charge *plus* gas, or two, three, or four part Demand Rate, Wright Demand Rate, or Flat Demand Rate were introduced, British undertakings would very quickly be in trouble with certain of their legislative restrictions.

These and other legislative enactments have hampered the development of the British Gas Industry, and therefore the Industry has been agitating for years for freedom from such restrictions. Committee after Committee has made recommendations, until in February, 1931, a Committee was set up, of which the author was a member, to report what amendments to existing gas legislation were desirable and necessary, to give effect by general legislation or by Special Order, to recommendations contained in the Second Report of the National Fuel and Power Committee. This Committee has issued three reports. As a result of the first, the Gas Undertakings Act, 1932, was passed authorizing gas undertakings to invest capital in other undertakings carrying on operations of a similar nature. The Second Report dealt with methods of charge, and the Final Report with various matters.

The position at the present time is that the Gas Industry is awaiting the production and passing of a Bill by the Government to give effect to the recommendations of the 1931 Committee contained in the Second and Final Reports.

With regard to methods of charge, the Committee did not recommend the introduction of compulsory multi-part tariffs for the reasons that many thousands of consumers upon whom much capital had been spent would go over to electricity, and also that it was not practicable to apply a service charge to prepayment consumers.

In the case of one company it was calculated that with a service charge of 30s. ($7.5) per annum and gas at two-thirds of the flat rate price, 22% of the small ordinary meter consumers would be required to pay on average 100% more than at present, and a further 29%, an average of 25% more. In such circumstances it will be realized that to put into force a compulsory two-part tariff would create great strife, and it must be remembered that, having spent one's capital on a supply, it requires a very small consumption to make it better business to keep than to do without that consumer.

The Committee made the following recommendations:

1. Undertakers desiring to introduce two-part or other charges should do so by entering into special contracts with their consumers by virtue of the provisions of Section 13 of the Gas-Works Clauses Act, 1847.
2. Undertakers should be required to publish particulars of the "ordinary" price at which they are prepared to supply gas in accordance with their statutory obligations.
3. Undertakers should be authorized by general legislation to impose a special charge on consumers whose premises remain connected to the undertakers' mains for "stand-by" purposes only. They should also be authorized to impose minimum quarterly charges calculated on the basis of an assumed consumption of 10 therms per quarter.
4. A provision should be enacted to provide (1) that gas sold under a special contract concluded by virtue of Section 13 of the Gas-Works Clauses Act, 1847, and (2) stand-by supply charge or minimum quarterly charge imposed, shall not, in the case of maximum and standard price companies, be taken into account for purposes of price and dividend control.
5. Maximum and standard price companies which find it desirable to discontinue operating under their existing price and dividend control systems should apply for authority to work under the "basic" system.
6. In connection with the future authorization of the basic system of control, there should be enacted in lieu of the "Board of Trade" Clause a provision for reduction of dividend authorization on the scale recommended in the report, and a similar provision should be substituted for the "Board of Trade" Clause when desired by undertakers at present operating under the basic system.

The above recommendations, if carried into effect, will allow undertakings to enter into special contracts with consumers on any terms mutually agreeable, but will not allow for the introduction of multi-part tariffs without the consumer having the option of being charged on the straight line rate.

The electrical industry has many tariffs, and although a few electricity undertakings have power to put multi-part tariffs into operation without a straight line rate option to the consumer, and any undertaking may obtain power to do so on application to the appropriate Government Department, none has done so. The electrical industry has the advantage over the Gas Industry of being of later origin, and consequently started with initial prices relatively higher, which gives it greater elasticity in making multi-part tariffs more attractive to the consumers. The Gas Industry will gradually work for making multi-part tariffs attractive to larger numbers of consumers as they find they can afford to release revenue for price reductions. There are a few gas undertakings in special positions with regard to legislation which have in operation, optional to the consumer, straight line meter rates and two-part tariffs, but generally the straight line meter rate is in operation with special discounts or rebates for quantities or for particular uses.

In 1927 a Report on Gas Charges was issued by a Committee, of which the author was a member, of the National Gas Council. This recommended tariffs, and contained a statement of definitions as applied to items of income and expenditure, together with a dissection or allocation of costs for the purpose of compiling two-part and four-part tariffs, and which showed the results of applying the two-part allocations to the accounts of certain undertakings.

Gas Sales.

Wherever gas is available there are very few houses without a supply, except where some local authorities owning electricity undertakings have gone to the length of making it a condition with tenants of municipal houses that they shall not use gas. Parliament, on protestations by gas undertakings, has recently given a very decided pronouncement against such action.

The following Table III. shows the spread of sales in the area of the Newcastle and Gateshead Gas Company, as shown by a comparatively recent census:

Table III.—*Showing the Spread of Sales in the Case of the Newcastle and Gateshead Gas Company.*

Class.	% of Total Number of Consumers for Each Class.	% of Year's Sales for Each Class.	% of Sales in Each Quarter to Total for Year.			
			Dec.-March.	March-June.	June-Sept	Sept.-Dec.
1	2	3	4	5	6	7
By prepayment meters—						
Domestic . . .	58·1	33·4	31	23	20	26
By ordinary meters—						
Domestic . . .	31·0	30·1	33	22	20	25
Industrial . . .	2·9	18·4	30	24	21	25
Shops	5·3	6·3	38	23	14	25
Offices	1·1	1·5	41	27	17	25
Boarding houses .	0·1	0·2	32	24	20	24
Institutions . .	1·2	3·0	36	22	15	27
Amusement halls .	0·1	0·5	31	24	18	27
Garages . . .	0·2	0·3	38	25	12	25
Bulk	..	0·9	30	20	20	30
Public lighting. .	..	5·4	33	15	14	38
	100·0	100·0	32	23	19	26

In Table IV. are shown the consumptions per consumer and per room for domestic consumers using *ordinary* meters. The results are surprising.

This table applies to a typical industrial area in provincial England. Conditions in London and in Scotland would be somewhat different.

TABLE IV.—*Showing Consumptions per Consumer and per Room for Domestic Consumers using Ordinary Meters.*

Number of Rooms per House.	Numbers of Consumers in Each Class of House.	Average Consumptions per Annum.	
		Per Consumer.	Per Room.
1	2	3	4
		C.Ft.	C.Ft.
1	156	12,200	12,200
2	1,300	13,000	6,500
3	9,552	16,600	5,500
4	15,707	19,000	4,800
5	12,853	21,800	4,400
6	6,466	32,800	5,400
7	4,849	33,400	4,800
8	2,875	38,800	4,800
9	1,596	47,800	5,400
10	881	54,800	5,500
11	368	66,000	6,000
12	462	82,600	6,800
13	104	79,200	6,100
14	213	88,800	6,400
15	41	95,800	6,400
16	65	99,800	6,200
18	24	111,200	6,200
20	22	89,200	4,500

Beyond 20 rooms the figures are very variable.

Up to at least the four-roomed house the kitchen is the living room, and is almost invariably provided with an open coal fire kitchen range (which always has incorporated with it an oven and sometimes a hot water boiler). This coal fire is kept burning all day and every day throughout most of the year.

In the five and six roomed houses this coal fire is found in the "dining room." In still larger houses it is to be met with in one of the general rooms and the kitchen.

The centring of family life round an open coal fire has largely determined both the design of British gas cookers and gas fires and the methods of approach of gas undertakings in their gradual substitution of gas for coal burning on the domestic hearth.

INDUSTRIAL SALES.

The question of the development of the sale of gas for industrial purposes is at present very seriously engaging the attention of the British Gas Industry. There are a few cities where it has been largely developed; in Sheffield about 50% of all the gas sold is for industrial purposes, and the percentage is on the increase, and in Birmingham the percentage is about 30. With appropriate scales of charges there is a great future for gas in Great Britain for industrial purposes. The Industry is being organized in districts with a large undertaking in each acting as a centre to which smaller undertakings may for a small annual subscription have the benefits of advice and assistance from the larger undertaking and take their customers to the demonstration rooms of the latter. The central undertaking periodically circulates to its members data obtained on jobs with which it has been dealing, and also supplies same to a Central Committee representative of the centres. This Central Committee will disseminate to all the districts such information as it considers will be useful.

PUBLIC LIGHTING.

Lighting of public streets by gas is very common, there being nearly 900,000 public gas lamps. Mr. George Evetts, in a book "The Gas Engineer's Compendium"—published in 1924—shows, by a census taken of 1000 cities and towns, that 87% of the public lamps were lit by gas. The percentage would be even greater if gas were judged on its merits; but municipalities owning electricity undertakings in many cases will not give gas a fair chance on merits and economics.

A big and increasing proportion of the public lamps are clock controlled, and considerable progress has been made in the application of directional reflectors and refractors.

ELECTRICAL COMPETITION.

Competition with electricity is very keen for domestic lighting and appliances. In many districts very little headway is being made with electrical cooking; it is found to be too slow and too expensive. With regard to heating, a gas fire is generally preferred because of the greater warmth given. As to lighting, electricity is usually preferred in better class houses, and it has made headway in other directions recently, largely due to the demand for "All Mains" radio connections; but with activity and enterprise on the part of the gas undertaking much can be retained and much can be, and is being, recovered. Every employee of the Company which the author serves is from time to time reminded to notify any information with regard to competitors' activities, and on receipt of such a notice a counter-canvassing team is sent out to the district concerned, and generally with very satisfactory results.

METER READING AND BILLING.

Accounts for gas consumed are generally rendered quarterly, but there are a few exceptions where undertakings have recently introduced monthly accounts. There are arguments in favour of each system—some consumers like monthly accounts; others prefer quarterly. The fact remains that it is much more costly to render and collect accounts twelve instead of four times a year. The author has had careful estimates and calculations made, and finds that in the case of his undertaking the cost per consumer would be doubled by rendering and collecting accounts monthly as against quarterly. In the case of one of the largest and most enterprising electricity undertakings the quarterly accounts system has superseded monthly accounts for their domestic consumers. Discounts for prompt payment of gas accounts are very general.

The British custom has been to read all the ordinary consumers' meters once a quarter in as short a period as possible, but the system of continuous meter reading and account rendering is now being adopted by many undertakings. The changes of tenancies of premises fitted with ordinary meters in the Newcastle and Gateshead Undertaking is about 12% in a year.

GAS MANUFACTURE.

In Great Britain the great bulk of the gas made is within the limits of 450 and 500 B.Th.U. per c.ft., and does not sufficiently differ in composition and specific gravity to prevent gas-burning appliances being reasonably standardized throughout the country.

The following figures show the quantities of coal gas and water gas manufactured in 1932 by Statutory Undertakings:

	Total.	
Coal gas made	254,350,650,000 c.ft.	= 82 %
Carburetted water gas made . .	40,803,280,000 ,,	= 13½ ,,
Gas purchased from coke ovens .	13,923,456,000 ,,	= 4½ ,,
	309,077,386,000	100

The large proportion of coal gas manufactured is due to there being a comparatively large demand for gas coke in Great Britain.

In the manufacture of water gas 800,000 tons of coke and 53 million gallons of oil were used in 1932.

Included in the coal gas made is that manufactured by the Gas Light and Coke Company in a battery of coke ovens installed in their Beckton Gas-Works, this being the only coke oven plant owned by a gas undertaking.

The latest *Gas World* "Analyses of Gas Undertakings' Accounts" show that for 46 companies the average manufacturing load factor is 46·8 and the distribution load factor 26·3, and for 67 municipalities 49·0 and 32·4 respectively.

Owing to the national and international depression in trade, and political interference over a long period, the coal industry is present in a very bad financial position. The old method of bargaining between buyers and sellers has been swept away by the Coal Mines Act, 1930, which provides for quantity quotas and the fixation of minimum prices, under which the price to the small user is the same as to the large consumer. The value of commercial ability in buying coals has therefore been discounted.

From the following figures it will be seen that the purchase of coke oven gas for distribution by gas undertakings is gradually increasing:

Year.	C.Ft.
1920	1,536,925,000
1921	1,324,807,000
1922	3,635,678,000
1923	4,268,055,000
1924	4,470,914,000
1925	4,797,752,000
1926*	2,321,850,000
1927	5,340,223,000
1928	6,560,389,000
1929	10,948,241,000
1930	13,201,351,000
1931	13,923,456,000

* Miners' strike.

The estimated quantities of surplus coke oven gas is a little over 50,000 million c.ft., whereas the sale of gas to the public by gas undertakings within 50 miles of any coke oven is three times that quantity. The purchase of coke oven gas is likely to increase further.

In 1930 a Committee appointed by the Board of Trade reported upon the technical and economic aspects of an

area gas supply system, the area considered being between the Humber and Liverpool and between Leeds and Birmingham, an area of about 14,300 sq. miles, which is highly industrialized and contains many coke oven and gas plants, important industrial gas users, and a large urban population. The Committee found that in only one portion of the area—in and around Sheffield and Rotherham—was a grid scheme feasible. This grid if fully carried out will comprise 73 miles of main varying from 6 in. to 30 in. in diameter, and estimated to cost £475,000.

Coke.

The total quantity of gas-works salable coke is about 10 million tons per annum, and about 1 million tons of this is exported, principally to Scandinavia. There is very keen competition both at home and in the export markets with coke produced at coke ovens. In the export markets competition is also experienced with coke oven coke from Germany, Belgium, and Holland. The prices realized for coke are higher than those realized for coke oven coke. Much money has recently been expended in providing plant for grading and screening gas coke in order to supply it in acceptable condition. Development has also taken place in the designing of coke stoves for water heating and of open coke grates. It has been found, however, that the latter displace a certain number of gas fires, and therefore discretion is required in developing this class of business.

The total annual production of tar by gas-works is about 1 million tons.

Benzole is marketed by the National Benzole Company, Ltd., the shareholders of which are benzole producers—*i.e.*, coke oven owners and gas-works making benzole, the benzole being sold to the public, mostly with petrol as a mixture, at the same price as No. 1 petrol.

During the current year many undertakings have restarted washing plants, as, owing to the effect of the import tax on petrol prices, the extraction of benzole is a commercial proposition.

Cost of Coal Less Residuals.

The average cost of coal and oil less the net revenue from residuals per 1000 c.ft. of gas sold shows for last year as follows:

	d.
3 London Companies	7·03 (14·6 cents)
9 ,, Suburban Companies	11·16 (23·3 ,,)
10 Provincial Companies	8·55 (17·8 ,,)
12 ,, Corporations	8·18 (17·0 ,,)

Amalgamation of undertakings has been taking place more frequently in recent years, and as a result of the powers of investment given by the Gas Undertakings Act, 1932, a holding Company has been formed of which the Gas Light and Coke Company has the controlling interest. It was formed at the beginning of this year, and now controls ten companies in the South-East of England, and the number is increasing.

Conclusion.

The consumer's test of the successful economic operation of an undertaking is price of gas, and the following shows the gross price charged for gas by a Company in London and the price of 2nd Class Durham Coal f.o.b.:

—	Gas per 1000 C.Ft.	Coal, f.o.b.
	s. d.	s. d.
1815	15 0	..
1829	12 0	5 6
1849	6 0	5 6
1873	4 4	16 0
1883	3 1½	7 0
1893	3 1	7 6
1903	3 0	9 0
1913	2 6	12 6
1923	3 9½	23 0
1932	3 7	14 9

The net charges for gas in 1932 for the provinces—*vide* "Field's Analysis"—were:

	s. d.
10 Provincial Companies	2 9·83 (70·48 cents) per 1000 c.ft. gas sold
12 ,, Municipalities	3 1·19 (77·48 cents) ,, ,, ,,

In at least three cases in the provinces gas is being sold for special industrial purposes for specified minimum quantities at about 1s. (25 cents) per 1000 c.ft.

Competition between gas and oil is very keen. While the recent import tax on fuel oil will assist the Gas Industry in its competition for heating work, competition with electricity will increase. The national electrical grid having cost more than estimated, and the consumption per head of population being less than estimated, the Government-appointed Central Electricity Authority is putting pressure on to the distributors to do everything possible to increase sales, and propose to help them in propaganda costs to that end. The Gas Industry, however, is prepared to meet the competition. It is, to-day, more vigorous and better managed than at any other period of its long history, and is looked upon by the public as the most enterprising of the public utilities. It gives good service to consumers to their great satisfaction, and has immense possibilities before it.

BOOK REVIEW

BRIQUETTE-MAKING.*

Tests for Selecting the Pitch.

A Fuel Research Technical Paper just issued by the Department of Scientific and Industrial Research deals with the determination of the viscosity of pitch. An important technical application of pitch is as a binder in the manufacture of briquettes from powdered coal. The investigation described formed part of a programme of work designed to correlate the laboratory tests of pitch with its suitability for briquette-making, but it is probable that the results will also be applicable to other branches of industry.

Briefly, the usual method of making briquettes is to compress, in suitable moulds, hot mixtures of powdered coal and pitch. Since the latter acts as a binder, the mixing, in the ideal case, should result in the spreading of a thin and uniform layer of pitch over each of the coal particles. It therefore appears, the report explains, that the important factors to be considered in regard to the behaviour of pitch in this process are its surface tension, which measures its wetting power, and its viscosity, which controls its speed of wetting. Of these two factors it was decided to study, in the first place, the viscosity.

The temperature at which briquettes are commonly made is between 90° C. and 100° C. It was, however, decided to investigate the viscosity over the range from 30° C. to 110° C., since the variation in viscosity at temperatures below that at which the briquette is made has probably some bearing on the behaviour of the briquette during and subsequent to cooling. Moreover, the determination of the viscosity over this wide range is of importance in connection with other industrial uses of pitch.

Owing to the large variation in the viscosity of pitch with change of temperature it was necessary to use three different methods to cover the range from 30° C. to 110° C. After describing the apparatus and method of operation, the report proceeds to discuss the results for five typical coal-tar pitches obtained from different types of carbonizing plant.

A sample of bitumen or petroleum pitch was examined by the same methods and was found to differ fundamentally from coal-tar pitch in its viscous properties.

* Fuel Research Technical Paper No. 39, The Viscosity of Pitch. Published H.M. Stationery Office; price, 6d. net.

A Novel Gas Fire Campaign.

"Personal" Letters to 14,000 Newcastle Consumers

A new and interesting method of "attack" has recently been evolved by the Newcastle-upon-Tyne and Gateshead Gas Company in connection with their gas fire campaign, which aims at embodying the "personal touch" in approaching consumers.

This takes the form of a letter hand-written on ordinary private notepaper—the written portion being lithographed and hardly distinguishable from ink—drawing attention to the advantages of the gas fire and its capacity to harmonize with any scheme of furnishing. Attention is also called to the Company's terms for supplying the fires, while particularly attractive is a series of five snaps of typical installation in pleasing settings enclosed with the letter.

Altogether no fewer than 14,000 of these letters have been sent out to Newcastle consumers, the envelopes being hand-written and bearing a 1½d. stamp to carry the "personal touch" still farther.

The "attack" is being sustained by Press, poster, and display publicity, and the letters, being novel, are well received, while the snaps are creating considerable interest. It is understood that very satisfactory results are being obtained in the campaign.

Public Works, Roads, and Transport Exhibition

The Public Works, Roads, and Transport Exhibition, which opened at the Royal Agricultural Hall, London, N., on Monday, Nov. 13, represented all the principal manufacturers who specialize in products dealing with the various activities of Local Government.

Altogether 250 firms were represented, and their exhibits ranged from heavy mechanical diggers and municipal motor transport vehicles of all types down to such simple items as children's playground equipment for parks, open spaces, swimming pools, &c. Several firms well known in the Gas Industry were exhibiting, and a brief description of some of their products shown may be of interest to our readers.

Among the exhibits on the stand of Messrs. John Allen & Sons (Oxford), Ltd., was an entirely new type of trench cutting machine, which should be of interest to the Gas Industry. This is styled the "6-12 Allen-Parsons" type, and is suitable for cutting trenches 6 in. or 12 in. wide down to a depth of 4 ft. Also shown was a "super-duty" trench excavator capable of cutting trenches 15½ in. to 54 in. wide down to 14 ft. deep, while other plant included the "Oxford-Handy" light roller with a new type of water-cooled engine; a grader for speedy and efficient soil grading and levelling; and a rotary scraper for soil moving.

The British Thomson-Houston Company, Ltd., had an attractive stand devoted to a display of highway and outdoor lighting, and examples of fittings used in conjunction with the installations.

The Chaseside Engineering Company, of Enfield, were exhibiting their new "Hi-Lift," which is claimed to shift a ton for 1d., and can be operated by anyone. The driver simply charges the heap of stones, sand, coal, coke, or whatever it is, and then raises his scoop and runs off with the load to wherever it is needed. The capacity is from 5 to 40 tons an hour. The "Hi-Lift" is well constructed to withstand exceptionally heavy wear and extremely reasonable in first cost and consequent upkeep.

On the stand of Messrs. Concrete Utilities, Ltd., of Ware, Herts., were a few examples of the first modern reinforced concrete lamp columns produced in England. These have been adopted by many lighting authorities throughout the country, and the number of engineers using them is rapidly increasing. There were examples of columns made with "Cullamix" and another treated with "Tintocrete." Concrete kerbing and concrete picket fencing were also exhibited.

The exhibit of Messrs. Electroflo Meters Company, Ltd., of London, N.W. 10, comprised "Electroflo" electrically-operated flow meters of the venturi, orifice, carrier ring orifice, rectangular weir, V-notch and venturi flume types, for the measurement of water and trade sewage, steam, air, oil, and gas; "Electroflo" suction and pressure gauges, indicating, recording, and control pyrometers; automatic regulators, gas analyzers, &c.

Other exhibits included the "Electroflo" model MDC. motor-driven CO_2 indicator and recorder; the "Electroflo" A.C. synchronous motor-driven, continuous strip chart, single and multiple recording pyrometers; temperature regulators; single and multi-point indicating pyrometers; suction and pressure gauges; level indicators and recorders, &c.

The exhibit was designed to demonstrate the ability of the Company to undertake the comprehensive instrumentation of any class of plant, and on the stand were shown photographs of important installations.

"Expamet" expanded steel, in its various meshes and weights, is used for all forms of reinforced concrete and fire-resistant construction. "RR" 6-in. mesh "Expamet" expanded steel is particularly suitable for use as reinforcement in concrete roadways, tramways, pavings, &c. "BB" expanded metal lathing affords an ideal "key" for plaster, in ceilings, solid and hollow walls and partitions, and all other classes of plaster construction. "Ribmet" "Z" type is applicable in plasterwork particularly where the bearers are too far apart for plain sheet lathing. "X" type "Ribmet" is used as a combined permanent centering and reinforcement for concrete flooring, roofing, &c. "Exmet" was designed specially as a reinforcement for brickwork, and samples of the foregoing materials were to be seen on the stand of the Expanded Metal Company, Ltd., and examples of some in actual use were also shown.

Photographs of a few important contracts in which "Expamet" expanded metal products were used, and models showing constructional details formed an attractive display.

As well as being an ideal reinforcement for concrete, "Expamet" is also an attractive fencing material; and, in its smaller meshes, adapts itself to effective and economical tree guards, refuse baskets, and the like.

Crushing, screening, and conveying are problems that Messrs. Fraser & Chalmers Engineering Works, of Erith, have specialized upon for years, and their exhibits of vibratory screens, mechanical and electrical, with a portable conveyor, were the result of accumulated years of experience. They have been responsible for some of the most modern and up-to-date screening and handling equipment in this country. The "Robins-Gyrex" double deck screen exhibited is a mechanically operated screen for medium and heavy duties, and for capacities up to the maximum demanded, and can be supplied with single, double, or triple decks. The single-deck screen is also mechanically vibrated and is for medium duties. The size of screening surface varies from 2 ft. by 4 ft. 6 in. to 6 ft. by 12 ft.

The "Sherwen" screen exhibited is a new development in efficient screening. The moving frame is rapidly vibrated electrically, 3000 vibrations per minute being imparted to the screen. It has a remarkably small power consumption, requires no lubrication, and is easy to operate. The amplitude of vibration and screening slope are easily altered.

The "Robins" portable conveyor is of rugged construction, and special features of design enable it to be operated at a low-cost per ton handled, ensuring continued successful operation.

A representative display on the stand of Messrs. Hailwood & Ackroyd included:

Street lighting lamp standards; directional signs; traffic yellow and red cylinders and globes; traffic lenses; illuminated island platforms and illuminated island platform posts, columns, &c.; lettered globes; architectural and general illuminating glassware and fittings for public buildings, theatres, cinemas, hotels, homes, &c.; iron and brass castings; stampings and machine parts in brass, steel, copper, nickel, &c.; also metal parts finished copper bronze, copper oxidized, nickel plated, silver oxidized, chromium plated, &c. Many of this firm's fittings are, of course, adaptable to gas lighting.

Automatic Control of Gas Lighting.

The exhibit of the Horstmann Gear Company, Ltd., of Bath, comprised appliances for the automatic control of both gas and electric street lamps. Automatic control as compared with hand lighting and extinguishing effects big savings in the maintenance costs of public lighting, this figure generally averaging from 12s. to 20s. per lamp per annum. In addition, the automatic system gives a far greater "flexibility" to street lighting than is possible with manual and group control. For example, certain lamps can be turned out at midnight, and relit in the early morning. Midnight reduction to half lighting can also be carried out. On the gas side the latest model was the "Newbridge" catalytic torch ignition controller, which entirely dispenses with the use of a by-pass except for a few minutes at the time of lighting. This latest development effects a considerable saving compared with the ordinary by-pass type of controller, as the amount of gas used at the lighting time is only one-eighth c.ft., and this is the total amount used every twenty-four hours. In addition, gas controllers for special purposes were displayed.

Various other products of the Horstmann Gear Company were displayed, including the "Newbridge" gas switch for the distant control of indoor gas lighting.

The exhibit of Messrs. Huntington, Heberlein, & Co., Ltd., comprised one of their latest type all-steel "H.H." vibrating screens, fitted with two screen decks. A new method of mesh mounting is adopted in this year's model. The "H.H." jigging screen is also shown, a machine of 6 ft. by 2 ft., with two screen decks, being demonstrated. Here, again, a new method of mesh retention has been adopted for this screen, which is characterized by high screening efficiency. This screen is mounted horizontally, thus forming a conveyor as well as a screen. Other models are built up to 25 ft. in length, and it is a simple matter, where long bunkers are to be served, to cascade one screen on to the next. The screen is actuated solely by means of an unbalanced pulley. Particulars were available at the stand of other products of the Company, such as vertical dryers, coke screens, &c.

Messrs. C. H. Johnson & Son, Ltd., of Cheetham, Manchester, were exhibiting examples of their patent portable power rammers, in which they have made a number of improvements on various models, the chief improvement being that the machine is now wholly self-contained with the ignition arrangement mounted on the rammer itself. This, of course, does away with the man carrying the battery and coil on his back. They were exhibiting their 140-lb. light-weight type and 230-lb. heavy duty type rammers, also their latest portable silent concrete breakers, and a range of three portable pile-drivers. Other features included their patent pile extractor, pipe-laying winch, timber drawer, vibrating screen, portable conveyor, &c.

Messrs. C. H. Kempton & Co., Ltd., were showing their "Kempar" asymmetrical low-pressure gas street lighting unit. This entirely new double-way reflector lamp will no doubt interest the illuminating engineer, first and foremost on account of its extremely high efficiency, and, secondly, that the maximum illumination from this lamp is emitted at 70° to 80° from the vertical.

This is claimed to be a unique distribution for any self-contained lamp, and there is only a loss of approximately 27% of the maximum intensity in the horizontal plane 40° from either side of the axis of the lamp, thus adequately illuminating side-

walks and surrounding buildings. The "Kempar" floodlamp is an ideal unit for illuminating swimming pools, architectural, and landscape lighting. A maximum of 6000 candle power is emitted with the special silvered glass reflector. "Kaye" gas coke fires, also shown, are designed for the efficient burning of coke in an open domestic grate. They are attractive in design, and economical in performance. The rocking bar attachment, which is included, is a feature for removing the ashes from the fire into the ash tray without poking the coke. It also has the effect of creating a fresh draught, and allowing the fire to burn itself out. A permanent gas burner is fitted standard on all models, and is used solely for the purpose of igniting the coke when commencing to burn the fire, thus dispensing with paper and wood. The "Kaye" fire may be obtained in a variety of colours, if required. "Kemorite," an exclusive finish, gives a result somewhat similar to chromium plating, and far superior to polished steel.

Many items of interest to gas undertakings' distribution departments were to be seen on the stand of the Lead Wool Company, Ltd., of Snodland, Kent, including lead wool for pipe jointing, with various pipes jointed and cut in sections to show consolidation; leaded yarn for jointing, consisting of spun yarn covered with a thin sheeting of lead, displacing ordinary spun yarn for jointing; bitumenized yarn for pipe jointing, consisting of spun yarn covered with a thin sheeting of bitumen; and flexible joints of lead wool, leaded yarn, and rubber ring.

Also shown were joint-testing apparatus for 30-in. mains and upwards, testing plugs for quickly closing the end of a main for testing; a hydraulic test pump; hand and pneumatic caulking tools for pipe joints, and chisels and cutting-out tools; wire brushes; and split socket and collar clips.

The firm's portable air compressor provided another interesting exhibit. The makers have utilized two Ford engines for the outfit, converting one of them into an air compressor, so that most spare parts for the engine and compressor are available throughout the world.

This F.C. 4 type air compressor is stated to provide a machine of reliable construction at a very low price and weight. The Ford industrial engine (model AB) is the power unit; and by fitting a specially designed air compressor head to a second Ford engine the makers have been able to produce a remarkably efficient compressor, having a piston displacement of 115 c.ft. of free air per minute and suitable for pressures up to 100 lbs. per sq. in. Without sacrificing strength in any way, the complete machine weighs only 20 cwt., thus rendering it very portable.

A Gas Street Lighting Display.

Messrs. W. Parkinson & Co., Ltd., of Stechford, Birmingham, were showing a complete range of gas street lighting equipment, including: The "Parkinson" series of pre-heated inverted burner lamps, fitted with either inside or outside gas and air adjustment and "Mor-lite" patent directional reflectors; the "1700" series suspension lamps and the "1900" series "U" fixing lamps, fitted with the "Mor-lite" reflector; the "Parkinson" conversion sets, upright inverted cluster burners, acetylene torches, &c.; the "Parkinson" traffic lamp, with chromium plated parabolic reflector and ruby lens; also "Danger" lamp complete with metallized burner, by-pass cock, &c., ruby glass bowl, and bracket are for attaching to standard. A series of "Flood-lite" lamps were also shown, both projector and alignment types, together with a small portable projector lamp, complete with stand. In addition, there were examples of cast-iron lamp columns, wrought-iron frogs, swannecks, harps, &c., and the "Kingsway" automatic controller for lighting and extinguishing street lamps.

Compact and complete portable screening plant was shown on the stand of Messrs. Parker, Winder, & Achurch, Ltd., of Birmingham, in addition to "Excelsior" steel mesh hand screens, boiling box screens, wedge bar screens, &c.

Interesting road and quarry plant, together with examples of industrial screening equipment, was to be seen on the stand of Messrs. Pegson, Ltd., of Coalville, Leicestershire. The Pegson high-speed breaker, commonly known as the "Pacemaker," runs at speeds of from 310 to 340 r.p.m., at which speeds an output is obtained that is claimed to be higher than normal for Blake type stonebreakers. All parts are constructed with a sufficient margin of strength to absorb far greater operating shocks than are met with in normal practice. Consequently, stoppages from breakdowns are remarkably few, and the cost for renewals is very low.,

The vibratory movement of the firm's "Live-Wire" vibrating screen is intensive, yet gentle. 1800 live pulsations per minute are transmitted to the screen cloth by the vibrating unit, which consists of only one moving part rotating in sealed dust-proof bearings. This action rapidly grades the material without damage to even the most delicate substance. The Pegson "Telsmith" vibrating screen is of heavier construction than the "Live-Wire," and is primarily constructed to deal with such materials that are too bulky for the "Live-Wire" The vibratory movement is produced by a steel shaft to which are fixed two roller bearings with eccentric centres. The vibratory movement, though powerful, is smooth, and is so balanced that no vibration passes beyond the screen frame. The Pegson vibrating table is primarily constructed for the consolidation of pre-cast concrete slabs, curbs, fence posts, and similar articles. There are no ratchets nor cams to wear out.

An object of special interest on the stand of Messrs. Priestman Bros., of Hull, was the patent "Level-Cut" grab, of which the half-yard size was exhibited. This is an entirely new departure in grab design of which the fundamental principle of operation is that the path taken by the cutting edges of the jaws is horizontal, and the crane operator can determine the depth of cut he wishes to take. By this means a level bottom is obtained.

Portable Compressors.

A series of portable compressors of various types was shown on the stand of Messrs. Reavell & Co., Ltd., of Ipswich. Of these, mention may be made of the No. 2 petrol engine driven compressor, which is a vertical two-cylinder, single-acting machine, with a piston displacement of 118 c.ft. per minute at 800 r.p.m., and is direct coupled to a four-cylinder "Dorman" petrol engine. An automatic centrifugal clutch is used between the engine and compressor so that the engine can be started up light. This feature is a very great advantage in cold weather, as it absolutely ensures easy starting. This set is mounted on rubber tyred wheels with cable-operated internal expanding drum brakes, which can be operated from the towing lorry.

On the stand of E. F. Sargeant, of York, were exhibited interesting working models of dragline cableway excavators and dragline scrapers for excavating generally, either in the dry or from under water; also of dragline scrapers for the storage of coal and other bulk materials. The plants have capacities from 15 to 600 tons per hour. A model screening plant showed the elevated screens arranged to take the material from the cableway excavator. A working model of a large scraper coal storage was also shown. The plant has a storage capacity of 100,000 tons, and was designed and supplied by the exhibitor.

Shown on the stand of the Sheepbridge Coal and Iron Company, Ltd., of Chesterfield, was a gyratory crusher for crushing and granulating wet and dry stone gravel, &c., and also a small elevator and vibrating screen for general elevating and screening purposes. There was also an exhibit of "Wenco Ful-lock" iron road plates for road-making.

The various products of the Staveley Coal and Iron Company, Ltd., of Chesterfield, include the following, of which samples were exhibited: Coal, pig-iron, fractures showing the various grades, sand-spun pipes, 16 ft. long, cast-iron pipes (vertically cast), 9 ft. and 12 ft. long, flange pipes, and specials. Also shown were examples of the Staveley flexible joint, tarred slag, wood wool for all packing purposes, chemicals, and bye-products.

Messrs. Stothert & Pitt, Ltd., of Bath, were showing a vibrating screen which embodies, in addition to the vibratory action, an oscillating action by means of eccentrics running in ball bearings in conjunction with being suspended on springs. This screen is suitable for all screening problems, such as coal, coke, stone, &c., and can be designed for any output and number of gradings required. The Stothert & Pitt hot mixer is a machine of particular interest to those engaged in road maintenance and path work, and meets the requirements of all who wish to make tarmacadam in small quantities either on site or at a depôt. This machine was referred to in the "Journal" for Aug. 16 last.

The firm's multi-bucket excavator is diesel engine driven, mounted to rail wheel truck, and it can dig in height or depth. Electric drive can be provided when desired and the unit can be mounted on caterpillar truck.

The Ross patent roll screen was shown for the first time on the stand of Messrs. Ross Patents, Ltd. It is a high-capacity machine, its "roll-vibro" action separating material with rapidity and completeness. The rear side of each aperture is formed by a smooth-surfaced member over which the material flows with a minimum of friction towards the aperture. The forward side of the aperture is formed by a serrated or rough-surface roll moving in an upward direction only with relation to the screen apertures, and carrying off the oversize material with a maximum of friction grip. The rear surface is thus totally different in character and action to the forward surface. The one promotes swift passage of fines through the aperture—the other promotes swift removal of the undersize material from the aperture.

The Ross feeder was also shown. This machine controls the flow of material from storage hoppers and in open-dump chutes. It handles any granular material of any size from primary steam-shovel stone to coal slack. The feeder consists of a curtain of heavy endless steel chains, driven by an overhead tumbler and suspended to lie on the material and travel with it.

The Tilley Lamp Company were exhibiting Tilley lamps of the portable types which are popular with contractors, &c. They are easy to light and keep in running order; there is no risk of explosion and there are no fumes. In addition, the lamps are easily carried about. Their floodlight projector is remodelled and is now mounted on stand with trunnions for tilting. As a result, the light can be directed upwards or downwards just as required.

The Tilley storm lantern gives a light of 300 c.p., and is designed for use where a portable type of lamp is required. It can be carried by hand, stood down, or suspended, just as required, and holds enough oil for 10 hours with once filling.

The exhibit of Turner's Asbestos Cement Company, Branch of Turner & Newall Ltd., demonstrated the great advance which has been made in the manufacture of "Everite" asbestos cement pressure pipes for the conveyance of water under pressure, gas, sewage, and also for innumerable industrial purposes. "Everite" asbestos cement pressure pipes are manufactured in accordance with British Standard Specification No. 468/1933, in sizes from 2 in. to 18 in. internal diameter and for working pressures up to 300 ft. head of water. The latest development is the production of "Everite" bends in asbestos cement for use in conjunction with pressure pipes, thus reducing the amount of metal necessary in a pipe line.

North of England Gas Managers' Association (Auxiliary Section)

Meeting in Newcastle.

The 27th Half-Yearly Meeting of the Auxiliary Section of the North of England Gas Managers' Association was held in the Gas Office, Newcastle, on Saturday, Nov. 25, when Dr. G. P. Lishman, F.I.C., Chief Chemist and Coke Works Manager, Lambton, Hetton, and Joicey Collieries, Ltd., read a paper on "Town Gas Supply from Coke Works." Mr. J. B. Henderson, Distribution Superintendent, Walker and Wallsend area, Newcastle and Gateshead Gas Company, the retiring Chairman, presided.

New Officers.

Chairman.—Mr. F. P. Fall, Sunderland.
Vice-Chairman.—Mr. S. A. Wickner, Newcastle.
Hon. Secretary.—Mr. L. M. Weldon, West Hartlepool.
Committee.—Mr. F. Nicholls, Gateshead, and Mr. T. T. Tarn, Darlington.

TOWN GAS SUPPLY FROM COKE WORKS.

By Dr. G. P. Lishman, F.I.C.

The secret idea at the bottom of this paper is to see whether by a certain amount of heart to heart talk some improvement cannot be effected in the methods of gas preparation as practised at Lambton Coke Works. So it will be well first of all to give an outline of the plant and how it is worked.

Having been built up from small beginnings—originally we had only 30 waste-heat ovens—the arrangement of the plant is quite confused and congested. Every time something has to be added there is the question of how it is to be got in. We have at present 35 waste-heat Semet-Solvay ovens and 35 regenerative ovens of the Simplex type. The difference between the two is that hot air is supplied to the flues for burning the heating gas in the latter case. Consequently less gas is used in heating and more surplus gas is available than from the waste-heat ovens. As nearly as we can tell the Solvay ovens consume 75% of their make of gas and the regenerative ovens about 55%.

Each battery has its own combined ram and charging machine. Three 8-hour shifts are worked, 9 ovens being pushed on each battery each shift. Every third oven is taken so that if a shift starts, say, on No. 10, it pushes 10, 13, 16, 19, 22, 25, 28, 31, 34, and the next shift carries on from No. 2. The hydraulic main offtake is in the centre, and by loading in this way the pressure is kept fairly uniform in the two ends of the main. Owing to variation in the coal moisture it is impossible to work to a schedule, but there is rarely any variation in the number charged per shift. The weight of a charge is 8 tons of dry coal and about a ton of water.

The two batteries have separate foul mains and primary condensers, the gases uniting at the inlet of the exhausters. They then pass in one pipe to the Pelouze-type tar extractor, after which they formerly went to the saturator, but sulphate making having been discontinued, one of the saturators has been converted with its acid catch box into a primary naphthalene catcher to be described later. After this we come to a serpentine condenser in which the gas is divided between three coils of 24-in. cast-iron pipes over which water is distributed. This condenser was put up in 1918, and this particular type was selected as cast iron had to be used instead of steel wherever possible. After this is a vertical type Dempster cooler just behind the Holmes rotary ammonia scrubber. The gas then goes on to the benzole scrubbers, after which it divides; part goes to the Solvay battery and boilers, and the other part goes to the Simplex battery. A branch is taken off from this for the town supply. The pressure at this point is about 3 in., and a valve on the town main is opened just far enough to allow the necessary quantity to pass, or, rather, just far enough to keep the necessary pressure on the ovens, for their requirements come first. The pressure after this valve is half an inch.

From this point the gas is under control of the booster. It passes first through a Dempster condenser which cools it usually from about 70° F. to 60° F. It then goes into a 9-ft. Holmes scrubber, the first half of which is used with calcium chloride for drying, and the second half with gas oil to wash out the naphthalene. From here there is a short suction range to the booster about 30 yards away. A pressure of 45 in. on the booster outlet gives 26 in. at the Sunderland end of the 15-in. main 8 miles away when delivering 60,000 c.ft. per hour. This is just about in accordance with theory. Before going further I should explain that another branch pipe leads from the Simplex main, just after the town offtake, to a small gasholder of 9000 c.ft. capacity. A return main from this holder leads into the town main just before the Dempster cooler. The purpose of this holder is to save the gas which would otherwise be wasted on the Simplex regenerative battery at the time of reversal. The course of the flue gases of these ovens is reversed every half hour so that the regenerators may retain their heat. At the moment of reversing the dampers, however, one regenerator is full of nitrogen and CO_2. When the air starts to come up through this regenerator owing to the reversal of the dampers the gas naturally will not burn until the waste gases are cleared out of the regenerators. So, instead of putting this live gas through the oven flues and causing the chimney to smoke, by altering two clap valves the gas is put into the holder for 3 minutes. The amount is usually 1500 to 2000 c.ft. As this reversal happens 48 times a day, an appreciable amount of gas is saved. The gas which goes into the holder in 3 minutes is gradually trickled back into the town main during the remaining 27 minutes of the half hour.

Primary Naphthalene Plant.

The primary naphthalene plant previously mentioned has no effect on the naphthalene content of our finished crude gas but is simply an arrangement for our own convenience in order to save steaming the ammonia scrubber and secondary coolers. In this it has proved very effective, for instead of steaming coolers every day and scrubbers every week (sometimes twice) as formerly, the steaming is done only every three or four months. One of the old saturators with its acid catch box, a vessel 9 ft. by 4 ft., has been filled with wood grids, and debenzolized oil is pumped over these while the gas passes through from the bottom. An inch pipe brings a small feed of debenzolized oil, while an equal amount of oil overflows back to the benzolized oil. If the gas temperature can be kept down to 100° F. a very good washing is obtained, but in our case it is more usually 130° or 140°. Even so the scheme has been, and is, a very useful one.

Gas Drying Plant.

The Holmes 9 ft. diameter scrubber is in two halves, each with five sections. Calcium chloride solution of 75° Tw. is circulated in the first and gas oil in the second half. The drying plant easily pays for itself in the saving on pumping syphons. All the same, we have to keep an eye on these. The first three on the pressure main are tried every week, and five more every month. There is usually some water in most of them. Except in cold weather we find ourselves unable to keep the dew point below earth temperature. There is normally a rise in gas temperature of 3° F. through the drier owing to absorption of water by the $CaCl_2$. The chloride itself rises some 10° F., the quantity of it being 500 gallons per hour. The chloride has continually to be concentrated and cooled, and the return chloride to scrubber is not always as cool as it might be. The best dehydration effect is produced when the inlet chloride temperature is below the inlet gas temperature and when there is a rise in gas temperature of not more than 10° F. through the scrubber.

A record is kept of the temperatures of the inlet gas, inlet and outlet chloride, and the twaddell of the latter. Some working figures may be given:

—	Inlet Gas Temp.	Inlet $CaCl_2$ Temp.	Outlet $CaCl_2$ Temp.	Strength of $CaCl_2$.	Dew Point of Outlet Gas.	Percentage Dehydration.
	° F.	° F.	° F.	° Tw.	° F.	
June, 1932	76	71	82	77	51·2	59
Nov., ,,	58	56	63	78	38·1	53
Jan., 1933	50	52	55	73	40·1	37
Feb., ,,	47	48	49	78·5	39·0	40
July, ,,	68	69·5	78	80	53·8	40

Some trouble from corrosion has been experienced at other places when drying crude gas, but we do not seem to be getting it—at least nothing has shown itself so far. The chloride solution is always neutral and the black sludge which forms, though containing some iron sulphide, con-

sists of calcium carbonate to the extent of 95%. This sludge settles in the underground calcium chloride tank and has to be cleaned out from time to time. The cost of calcium chloride so far has amounted to 0·044d. per 1000 c.ft.

Naphthalene Washing.

Coming now to the naphthalene washing. "Blessed are they whose annals are vacant," as the historian said. So far as the scrubbing is concerned the annals may be said to be completely vacant. The scrubber is easily equal to its job. This is not to say the gas has always been perfect—far from it. Having no water gas plant to use up the spent oil we are forced to rejuvenate it by continuously withdrawing some 20 gallons per hour and putting it through a naphthalene stripping plant. You notice I do not say stripping it of naphthalene. The plant does not do that; when doing its best it reduces the oil from 3·5 to 2·8 or 2·9% naphthalene. In these circumstances the gas can be kept down below 1 grain per 100 c.ft., but one little thing after another has happened to the plant to increase its natural inefficiency. It would hardly be of general interest to go into all these little things, especially as at the moment of writing we seem to be in smoother water and only waiting for the next snag to show itself. The gas comes dried to the naphthalene washer containing 10-12 grains of naphthalene. Taking 1½ million c.ft. per day this means removing 24 lbs. per day of naphthalene, and all this has to be got out at the oil recovery plant.

Oil Recovery Plant.

The oil recovery plant consists of a small steam jacketed still with its attendant condensers, separators, and oil cooler. To these we have added an additional oil cooler and an oil pre-heater.

It is of interest at this point to recall the figures for the amount of naphthalene carried by dry coal gas (Thomas):

At 32° F.	1·75	grains per 100 c.ft.
41° ,,	3·15	,, ,,
50° ,,	5·49	,, ,,
59° ,,	9·39	,, ,,
68° ,,	15·8	,, ,,
77° ,,	26·0	,, ,,
86° ,,	42·0	,, ,,
95° ,,	68·0	,, ,,
104° ,,	107·0	,, ,,
113° ,,	166·0	,, ,,
122° ,,	254·0	,, ,,

So it is best to keep the temperature well down or you soon double or treble the load on your plant.

The cost of running is not heavy. Owing to the various troubles we have had to deal with, ours for the first 20 months has been heavier than need be, but even so it has amounted to 0·05d. for oil and an all-in working cost, including drying and labour, of 0·173d. per 1000 c.ft. This excludes some alterations to plant. I think we should now proceed to the talk referred to in my opening paragraph.

Discussion.

Mr. L. Robertson (Sunderland) said that he had charge of one of the Sunderland Works supplied by gas from Dr. Lishman's works. A large percentage of the gas at the author's works seemed to be required to heat the ovens, and that appeared to indicate that oven practice could not compete with modern retort practice from a gas-making point of view unless the unit was of large capacity and carbonized more than 1200 tons of coal a day and was heated by means of outside producers. Modern horizontal retort practice produced for sale about 72 therms of gas per ton of coal carbonized, while with ovens about 65% of the gas made was used for heating, and only about 25 therms of gas was available for sale of all the coal carbonized. Better heat insulation and regeneration might effect economy, and waste heat from the batteries could perhaps be utilized for steam raising or feed water heating. As to charging the ovens, he noticed that 9 ovens were taken every shift in each battery, a total of 18 discharges per shift. Had each battery its own set of men? He would also be interested to have the size of one of the ovens.

Producer Gas for Heating the Ovens.

Mr. A. H. Bagshaw (Sunderland) could not see how the author could produce more gas without capital outlay. The obvious thing was to use producer gas for heating the ovens, instead of coal gas. Dr. Lishman also used a certain amount of coal gas for heating boilers, and there were possibilities of economy there. There was also the question of the installation of a Neckar water softener. It was cheap to use, and the cost ran out at something like 1d. per 1000 gallons instead of about 2½d. in the ordinary process. If that type of installation did not appeal to Dr. Lishman there was always the heating of feed water. Generally, there would be an adequate quantity of steam available which might be utilized, thereby reducing the amount of coal gas used on the boilers. Another possibility was the installation of a gasholder. Then, insulation was becoming more and more important as time went on; yet insulation was practically non-existent in many of the coke oven plants he had seen. Looking at Dr. Lishman's results with a critical eye, he thought that it was a good thing that gas engineers did not produce the same.

Naphthalene Washing.

Mr. F. Nicholls (Gateshead) said that Dr. Lishman had selected a topic of particular interest to all of them. He himself had had five years' experience in receiving coke oven gas. He would have liked more information about the quality and composition of the gas which Dr. Lishman supplied. The naphthalene washing plant seemed all right, though the naphthalene content of the gas when it reached Sunderland did not seem to be what it should be. Occasionally, 2, 3, or more grains were found in the gas. The figure of 0·05d. for oil seemed to be exceedingly low. With oil at 4d. to 5d. per gallon, it represented only 10 to 12½ gallons per million c.ft. That was less than half what it should be. He was supported in this contention because of the presence of from 2·8 to 3·5% of naphthalene in the oil. He did not think, personally, that it was possible to keep the naphthalene content consistently below 1 grain if the naphthalene content in the oil in the first bay of the washer exceeded 2½%.

They had to remember, among other factors, that the long main from the coke works to the gas-works (8 miles) formed a large collecting box for naphthalene, perhaps deposited in small amounts over a period, but given up later in much larger amounts over a shorter period. Gas engineers realized by experience what a "bogey" this naphthalene was, but coke oven managers did not seem to attach the same importance to it.

Some gas companies had perforce to put their gas straight on the district without further washing, relying on the coke oven suppliers to carry out their obligations. Gas companies had been washing their own gas for, say, ten years, and had the satisfaction of finding their mains becoming clear of naphthalene, instead of perhaps half or two-thirds full. But if all the money, time, and energy spent in achieving this desirable end were to be set at nought by the periodical lapses of coke oven operators, then, from the gas undertakings' point of view, it was going to become a serious state of affairs. If amicable relationships were to be maintained, the coke works must be prepared to attack the naphthalene question much more energetically and much more consistently in the matter of washing plant and adequate provision for oil renewal than they appeared at present disposed to do.

He himself had had experience of coke oven gas in which the old rule of 2½% of air for revivification took no cognisance of the usual 0·5% of free oxygen in the gas coming from the retort house. That in itself was equivalent to 2½% of air, making a total of 5% required for revivification.

The coke oven gas had been made in the latest type of oven controlled by "Askania" oil governors maintaining a constant pressure on the oven and giving a gas practically without free oxygen. It appeared that under those conditions coke oven gas would require 4 to 5% of air for efficient revivification, and an increased air supply soon had the desired effect, without showing an excessive amount of oxygen at the outlet of the purifiers. The opinion might be held that such an air supply might be dangerous and might cause firing of the purifiers, but he took the opposite view.

It was his contention that with a restricted air supply there was a tendency to accumulate an excessive amount of sulphided iron, and when for any reason it was necessary to increase the air supply, then the conditions were ideal for causing firing. But if the air supply was consistently substantial, neither of those conditions was so likely to arise. Hence, conditions would be safer, with the added advantage that oxide might be worked up to strength with only one emptying.

The effect of this was that, where it was proposed to purchase gas from up-to-date ovens, it was necessary to stipulate that the calorific value should be high enough to leave a sufficient margin to permit the addition of adequate air for purification.

Calorific Value of Coke Oven Gas.

There were one or two things that tended to smooth working. Calorific values should be exchanged at least hourly, but much more frequently if the instrument at either works was temporarily out of action. Whenever there was reason to expect a drop in calorific value the coke works should warn the gas-works as soon as possible, to allow the latter to take steps to nullify the effect. That was feasible where the volume of coke oven gas was not too large, but if it was, say, three or four times the amount made at the gas-works then a drop of 30 B.Th.U. in the coke oven supply would require a rapid rise of 90 to 120 B.Th.U. in the gas-works supply, which, of course, bordered on the impracticable. Under those conditions, the coke ovens must undertake the same responsibilities to the gas-works that the latter did to the consumer. Hence, it was no use to say that it was impossible to work to a schedule. A schedule must be worked to in pushing the ovens if the gas was to be kept to the calorific requirements of the Gas Regulation Act. Similarly, the gas-works should give reasonable warning of any appreciable valve alterations, so as to avoid causing trouble to the boosting plant at the coke works.

Mr. T. T. Tarn (Darlington) said he was interested in the nature of the gas and the purification of the gas when it reached the gas-works. What percentage of ammonia was there in the gas stream? If this was present to any considerable extent, the gas-works might find difficulty in purifying the gas. Again, what was the number of grains of sulphuretted hydrogen? Over a distance of between 7 and 8 miles, there would probably be some temperature drop between the coke works and the gas-works. Could Dr. Lishman tell them just what was the drop in temperature? He would also like to hear a little more with

regard to the trouble which had been experienced at the coke works with naphthalene.

Benzole Recovery.

Mr. S. A. Wickner (Newcastle) remarked that benzole was important, and Dr. Lishman probably handled anything up to from 200,000 to 300,000 gallons a year. Here might be a subject having some bearing on the naphthalene trouble. He would like to know what oil Dr. Lishman used in the benzole scrubbers. If he used creosote, then it had to be remembered that that, too, contained naphthalene. Several works he knew of were now using gas oil successfully to eliminate naphthalene.

Mr. Bernard Richardson (North Shields) said that he had had some experience with benzole extraction, and had found gas oil a very satisfactory absorbent.

Mr. G. E. Anderson (Willington Quay) thought that Dr. Lishman would naturally look first of all to the quality of the coke he was producing, and the yield. He (the speaker) was surprised that the author had made no mention of calorific values. He was interested to know where the gas was measured

Mr. F. P. Fall (Chairman-Elect, Sunderland) said that most of the speakers had dealt with the subject from the engineer's point of view, and had overlooked the financial and commercial aspect of it. From the engineer's point, he thought he could suggest several things which might improve the working methods of the coke oven plant, but they involved spending money, and Dr. Lishman did not want to spend money on expensive new plant. Of course, there was the possibility of installing second-hand plant, but personally he did not like doing that.

The Author's Reply.

Dr. Lishman, replying to Mr. Robertson, said that he used waste heat from the waste-heat battery for raising steam in connection with four Lancashire boilers. The waste heat was not used from the Simplex battery, which had a temperature of about 450° F. at the chimney bottom. Each battery had its own set of men. The charging went on continuously except at the week-end. What was lost on the last shift on Saturday night owing to the nature of the shift worked, was made up on Sunday morning. The coking periods were between 30 and 31 hours. As a rule, there was no interval of charging, and that could hardly account for any variation of gas that might be experienced. The dimensions of the ovens were about 20 in. wide, 7 ft. high, and about 34 ft. long.

Replying to Mr. Bagshaw, Dr. Lishman said that it did not pay to heat the ovens with producer gas. He remembered seeing it done in Vienna about 25 years ago. The gas-works there seemed to have been simply coke ovens run on producer gas.

The softening of water was necessary, of course, and they were doing it in the ordinary way with caustic soda, and it was satisfactory, though perhaps not so cheap as with the Neckar water softener. He quite agreed that a gasholder of, say, 500,000 c.ft., would be a good idea, but he did not think that there was much chance of that. There was room, too, for more insulation.

Mr. Tarn had asked what percentage of ammonia there was in the gas stream. There was hardly any. As to the drop in temperature of the gas in the mains between the coke plant and the gas-works, as far as he recollected, he believed the temperature was about 60° F. at the coke plant and about 40° F. at the Sunderland end. There had been trouble in regard to ammonia, and there had been some difficulty in stripping the naphthalene. They had also met difficulties in the use of gas oil.

Coming to Mr. Wickner's remarks, Dr. Lishman said that he had used creosote oil in the benzole scrubbers. He had already referred to the trouble with the use of gas oil.

Replying to Mr. Richardson, Dr. Lishman said that the qualities of gas oil seemed to be apparent, and he would like to use it; but after the experience which he had had with it and the difficulties which would attend any change, he thought that he would have to do a good deal of thinking before he actually made the change.

The measurement of gas was done at the Sunderland end.

Votes of Thanks.

Mr. N. Reid (Gateshead) moved a vote of thanks to Dr. Lishman, and Mr. J. E. Dixon (Newcastle) seconded.

Mr. C. F. Barrow (Sunderland) and Mr. J. L. Ford (Darlington) moved and seconded respectively a vote of thanks to the Chairman, Committee, and Hon. Secretary.

This concluded the meeting, after which tea was served in the Gas Office.

Oriental Gas Company

ANNUAL GENERAL MEETING

The Annual General Meeting of the Oriental Gas Company, Ltd., was held on Thursday, Nov. 23, at the Offices of the Company, Finsbury House, Blomfield Street, E.C. 2—Mr. Stanley H. Jones, M.Inst.C.E. (the Chairman of Directors), presiding.

The Secretary (Mr. S. Rainer) read the notice convening the Meeting, together with the report of the Auditors, while the report of the Directors and statement of accounts for the financial year ended June 30 last were taken as read.

The Chairman's Address.

The Chairman, in moving the adoption of the report and accounts, said:

Since we last met there has been no marked change in the trading conditions of India in so far as this Company is concerned, although if there has been any change at all it has been for the better, and is perhaps reflected to some slight extent by the small increase in the sale of gas which we have to report—0·6%.

The new contract for the public lighting of the city of Calcutta which commenced in February of last year appears to be running smoothly and satisfactorily.

We have made a reduction in the price of gas to the private consumers of As. 8 per 1000 c.ft. as from the end of the March quarter, 1933, and this, we hope, will stimulate the demand when trading conditions improve.

Turning to the accounts, the capital account remains unaltered. In the revenue account coals cost £29,258, as compared with £33,861 in the previous year, a saving of £4603, the tonnage carbonized being 43,192 tons, as compared with 49,656 tons. Salaries in the manufacturing department were more by about £390. Carbonizing wages were less by £240; purification was about the same, but repairs and maintenance were less by £6262, the repair work having been lighter this year than last. The total manufacturing cost was less by £10,786.

In distribution the total cost is less by £1601; salaries and wages of officers being, however, slightly higher by £36 and repairs of mains and services higher by £570, but meters were less by £1419, and fittings by £789.

Public lamps were less by £1655, the maintenance of the lamps in Cossipore and Manicktollah districts having been transferred under the new contract to the Corporation. Rents, rates, and taxes were more by £1494, due to taxation on a higher balance of profits. Management shows a small reduction of £230. No bad debts were incurred. Law charges were less by £94; superannuations and pensions were more by £70; passages were less by £477, fewer officers having been on leave. Insurances were less by £329.

Turning to the receipts side, gas rental was less by £6269, due to the decreased rates for public lamps for the whole year and decreased price to private consumers for the last quarter of the financial year. Meter and stove rents were slightly less by £83.

Residual Products.

Coke and breeze were less by £1639, due to a lesser quantity being sold—18,729 tons, as compared with 24,507 last year—and to a somewhat lower average rate per maund. Tar showed a slight increase of £58, more favourable rates obtaining having been almost neutralized by smaller sales. Rents receivable showed a small increase of £28. Transfer fees at £8 indicate the few dealings during the year. The final balance of profit carried to net revenue account was £34,999—an increase of £5746 on the previous year.

The Directors, as you will see, have transferred a sum of £10,000 to reserve fund, and this has reduced the balance available for distribution accordingly. It now stands at £110,125 7d. 5d. Bank interest was £303; interest on investments was £828; exchange profit was £6600. Depreciation, renewals, suspense, and exchange accounts remain as heretofore.

As regards residuals, as I have said, 18,468 tons of coke were sold and 499,691 gallons of tar. The market for coke has been depressed and prices received have been low.

Turning to the balance-sheet, our investments stand at £26,139, and our cash at bankers and in hand is £29,557. Amounts owed by the Company were £8351, and amounts due to the Company were £3195.

You will observe that we propose to you a final dividend free of tax, and for your information I may say that for many years the dividend was paid free of tax, and we have thought that for this occasion we might resume the payment of dividend on a similar basis which we hope you will approve.

More Public Lamps.

It is gratifying to record that there has been a net increase of 141 public gas lamps added to the system in the period of the new public lighting agreement from Feb. 1, 1932, to June 30, 1933. There are something like 18,000 public lamps in the streets of Calcutta. A new agreement for the lighting of the Calcutta Maidan for a period of ten years was concluded with the Government during the year under review.

There are indications of a development of the use of gas for trade purposes in the outer area of the Company's district of supply, and to meet this we have been adding to our system of mains and have revised our scale price of gas for such purposes, and we hope for satisfactory results.

The Manager reports that the Company's plant is in good

and serviceable condition. He also reports that relations with the Public Authorities have, as usual, been quite satisfactory.

In conclusion, I would say that our best thanks are due to Mr. Garsed and his staff for the good work they do for us. This will be the subject of a special vote.

I will now propose the adoption of the report and accounts, and will ask Mr. Ellis to second the resolution, and I shall be pleased to deal with any questions you may wish to ask before putting the resolution to the vote.

Mr. B. W. ELLIS, A.M.Inst.C.E., formally seconded the resolution.

Mr. W. PARKER congratulated the Directors on what he considered the best report they had had for many years, and inquired if the Company were taking any steps as a result of the possibility of exchange stabilization.

The CHAIRMAN replied that they had sought the opinion of their bankers, and had come to the conclusion that for the moment they had better do nothing in the matter. It was, however, receiving their attention.

Mr. D. H. MCLAUCHLAN also congratulated the Board on the report before them, which, he said, was very gratifying to the shareholders. In regard to the value of the rupee, he noticed that there had been a profit on exchange of £6600, and was puzzled to know how they made that amount. In the accounts they valued the rupee at 1s. 4d., and he took it that the profits of the Company were made in rupees and were reckoned at the rate of 1s. 4d. in sterling. The shareholders were very gratified that the Board had been able to place before them so satisfactory a balance-sheet—especially as regards the dividend. The point he would like to emphasize was, however, that the Chairman and his colleagues would not have recommended such a dividend unless they had felt confident in being able to put forward a similar balance-sheet next year. In conclusion, he asked what effect the stabilization of the rupee would have on them.

The CHAIRMAN stated that if the rupee were stabilized at 1s. 4d. they would lose the £6600. But they always endeavoured to earn their profits on their revenue account; they certainly had every confidence in the future of the Company, and they would not have recommended this dividend if they did not feel confident. The strength of the Company lay in the small amount of capital per million c.ft. of gas sold; they would never think of declaring a dividend on the strength of the exchange.

The resolution was then put to the meeting and unanimously adopted.

DIVIDEND.

The CHAIRMAN then moved the payment of a dividend at the rate of 4½%, free of income-tax, making 8% for the year.

This was seconded by Mr. B. M. GILL and carried unanimously.

RE-ELECTION OF DIRECTORS.

The CHAIRMAN proposed the re-election of the Directors retiring by rotation—namely, Mr. B. W. Ellis and Mr. B. M. Gill—remarking that these gentlemen served the Company well, and they would be very sorry to be without them.

This was seconded by Mr. H. H. MACLEOD and carried unanimously.

Mr. ELLIS, in acknowledgment of this continuance of confidence in him, remarked that he had been connected with this Company for more than forty years and was one of the largest shareholders, so that his interests were naturally wrapped up with theirs.

Mr. GILL also briefly acknowledged.

RE-ELECTION OF AUDITORS.

On the proposition of Mr. J. H. FLETCHER, seconded by Mr. MCLAUCHLAN, the Company's Auditors, Mr. S. W. Savage and Mr. F. J. Bradfield, were unanimously re-elected at a remuneration of fifty guineas each; and Mr. BRADFIELD briefly acknowledged this renewal of their confidence.

Mr. W. PARKER moved, and Mr. H. FLETCHER seconded, a resolution to increase the annual remuneration of the Directors by the sum of £500, which was also supported by Mr. J. H. FLETCHER and unanimously approved.

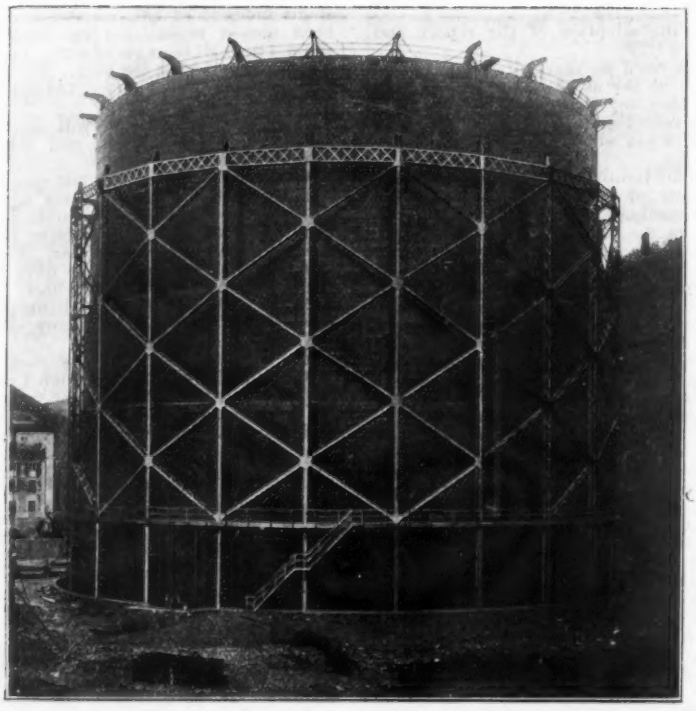
The CHAIRMAN, in response, stated that it had been felt that this matter might be brought up on this occasion, as the last time the Directors' fees were dealt with was twenty-two years ago, since when the business of the Company had grown by 50%, and the present fees were considerably less than those in other companies of a similar nature.

VOTES OF THANKS.

Mr. B. W. ELLIS then proposed a hearty vote of thanks to the management and staff of the Company both in London and Calcutta. This was not, he said, an ordinary, formal vote of thanks, but one which he was glad to say he had proposed for many years past with personal enthusiasm, and it had always been received in the same way. There was a certain amount of sameness in this vote of thanks, and he earnestly hoped that those who might propose it in the future would always have the same story to tell—namely, one of continued energy and devotion to the Company's interests. In regard to their Manager in Calcutta, Mr. Garsed, the results of the past year spoke for themselves as regards efficiency of management. Mr. Savage had been home on leave during the year, and they had been very glad to see him and had had useful talks. Mr. Smith, their Works Superintendent, was, he was glad to tell them, renewing his agreement with them for another period, which he thought

SAML. CUTLER & SONS LTD

ENQUIRIES INVITED FOR ALL TYPES OF GAS-HOLDERS



39, VICTORIA ST., WESTMINSTER, S.W. 1
Telephone No.: VICTORIA 8492
Telegraphic Address: RETORTUS, SOWEST LONDON

PROVIDENCE IRON-WORKS, MILLWALL, E. 14
Telephone Nos.: EAST 1734-1735
Telegraphic Address: CUTLER, MILLWALL, LONDON

414

they would agree was mutually satisfactory to both sides. Mr. Morrison, their Superintendent of Meters and Fittings, had experienced an uphill task during the year as a result of a number of empty flats and houses in Calcutta, due to the times through which they were passing; but, ably backed by his assistant, Mr. J. H. Pope, he had manfully tackled the industrial side of their business with considerable success. Mr. Bathgate, who was in charge of their mains, had not had so much to do during the year in regard to main-laying, and had turned his attention to leakage, with the result that their leakage figure had dropped by 2%, which was a very important point indeed. In addition to this, complaints in connection with the municipal lamps had dropped by one-fifth. The compilation of the accounts before them spoke to the efforts of their accountant, Mr. Carlisle. They had also had the advantage of the services during the year of two other officers, Messrs. W. E. Gladstone and A. Petts, whom they shared with the Bombay Gas Company.

As regards the London staff, what could he say new about Mr. Rainer? He had been in the office for forty-five years, and had every detail of the Company's history at his finger-tips. He received able help from his assistants in the London Office, and it was a pleasure to work with them.

Mr. W. G. BRADSHAW, C.B.E., said it gave him great pleasure to second this vote of thanks.

The vote was unanimously carried, and, in reply, Mr. RAINER said it would give him great pleasure to convey this to the management and staff in Calcutta and to his assistants on this side. Mr. Garsed and his staff, as they knew, had to bear more than they in London; the climatic conditions made their duties more strenuous than in this country. He thanked them very much on their behalf and on his own.

PROOF OF PROGRESS.

Mr. F. J. BRADFIELD, in proposing a vote of thanks to the Chairman and Directors of the Company, emphasized how pleased the shareholders were at the good results of the year; but he wondered whether they all realized the improvements which had been effected in the financial position of the undertaking, and proceeded to give sundry interesting details in this respect. He considered that this progress fully justified their confidence in the Company and the increased remuneration they had voted the Directors, and he hoped they would join him in congratulating the Board on their services during the past year.

Mr. PARKER associated himself with the previous speaker's remarks, and said that it was not fully recognized that vacancies sometimes occurred on the Board, and a first-class company was entitled to have first-class Directors. They frequently had to go outside the Company, so that it was not reasonable to expect a first-class man to come in and give his time and the benefit of his knowledge for an inadequate remuneration.

The vote of thanks was carried unanimously, and in acknowledging, the CHAIRMAN said that the Board devoted serious attention to the Company's interests, and it was a great pleasure to see the Calcutta Gas Company so strong in regard to its low capital.

This terminated the business of the meeting.

Danish Gas Company.

The accounts of the Danish Gas Company for the year ended June 30, 1933, show a balance standing to the credit of the profit and loss account, after charging pensions, administration expenses, &c., and transferring Kr. 214,153.42 to the redemption accounts of Kr. 443,286.37. Out of this sum the Directors recommend that a dividend of 6%, or Kr. 8.10 per share, be declared. This will leave Kr. 188,136.37 to be carried forward, a decrease of Kr. 53,584.02 on the amount brought in, due mainly to the increased expenditure on renewals and repairs as compared with the previous year and to the fall in the Danish exchange.

A further capital expenditure of Kr. 190,810.33 for the extension of the carbonizing capacity, mentioned in the last report, and for additional plant, mains, services, and meters has been incurred during the year, and all necessary renewals and repairs have been carried out, so that the works are in a condition to meet the demands of the coming winter. A further extension of the carbonizing capacity has been carried out during the past few months, the cost of which will fall mainly in the accounts for the current year.

The quantity of gas sold during the past year has been 10,794,013 cu.m. (381,414,000 English c.ft.) against 10,713,997 cu.m. (378,586,000 English c.ft.) in the previous year, being an increase of 80,016 cu.m. (2,828,000 English c.ft.), or 0·75%

The fluctuations in the rate of exchange between Danish currency and sterling have affected the Company's revenue. At the beginning of the account year Kr. 18.60 equalled £1, but early in 1933 the exchange was more or less fixed at Kr. 22.50, and as the price the Company can charge for gas is based on the sterling value of coal, there was a consequent loss of revenue. The Odense Authorities have been approached on the matter, but so far no relief has been granted.

This Model Coin Collector

Was *supplied* in 1901

And is *still* in use

Telephones:
MANCHESTER: 2289 COLLYHURST
NOTTINGHAM: 75202
WATFORD 2645

Telegrams:
SAWER, MANCHESTER
SAWER, NOTTINGHAM
2645, WATFORD

Quality Tells

SOLE MAKERS: SAWER & PURVES
(BRANCH OF METERS LTD.)

NELSON METER WORKS MANCHESTER 10
DERBY ROAD WATFORD
RADFORD METER WORKS NOTTINGHAM

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The uncertainties of the foreign exchange market were still the dominant feature last week, and in the absence of support prices eased in most sections. Towards the end of the week the outlook was a little brighter when it became known that strong opposition was developing in the United States to the President's monetary policy, and under the lead of gilt-edged securities markets showed more activity. The movement, however, was short-lived, and the week closed with a return to quiet conditions.

The general situation was to some extent reflected in the Gas Market where the volume of business was on a reduced scale, though prices on the whole were well maintained. An important exception was that of Gas Light units which dropped a further 9d. to 25s. 9d.-26s. 9d. At the time of writing the stock is offered at 26s. 6d., which gives a yield of £4 4s. 6d.%. Another fall was that of British ordinary, which eased 4 to 157½. On the other hand, the market was by no means devoid of improvements, and it will be seen from the Stock and Share List that, under the lead of Preston 5% preference, which jumped 4 points to 107½, and Derby 4% debenture with a rise of 3½, several gains of from 1 to 2 points occurred.

The Directors of the Montevideo Gas and Dry Dock Company, Ltd., have announced with regret that owing to the continuance of restrictions upon exchange and the consequent inability to obtain sufficient sterling remittances from Montevideo, it is impossible to pay an interim dividend for the half-year to June last. They state, however, that the results for this period show an improvement on the corresponding half-year of 1932, and are such that would have enabled them to declare an interim dividend if funds had been available.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Nov.* 27.

The market for tar products continues steady, and current prices are as follows:

Pitch is about 75s. per ton f.o.b.

Creosote, 3d. to 3¼d. per gallon.

Refined tar, 4d. to 4¼d. per gallon in bulk at makers' works.

Pure toluole is about 3s. 3d.; pure benzole, 1s. 10d. to 1s. 11d.; 95/160 solvent naphtha, about 1s. 9d.; and 90/140 pyridine bases, about 5s.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Nov. 27.

The average prices of gas-works products during the week were: Gas-works tar, 28s. to 33s. Pitch—East Coast 67s. 6d. to 70s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 67s. 6d. to 70s.* Toluole, naked, North, 2s. 6d. to 2s. 8d. Coal-tar crude naphtha, in bulk, North, 6½d. to 6¾d. Solvent naphtha, naked, North, 1s. 7d. to 1s. 7½d. Heavy naphtha, North, 10½d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2½d. to 2¾d.; low gravity, 2d. to 2⅛d.; Scotland, 2½d. to 2¾d. Heavy oils, in bulk, North, 4d. to 4½d. Carbolic acid, 60's, 2s. 4½d. to 2s. 6d. Naphthalene, £10 to £11. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Nov.* 25.

Little change has taken place in this district during the week. Prompt supplies are not too plentiful, and prices of most products are steady.

Crude gas-works tar.—The actual value is 40s. to 42s. per ton *ex* works.

Pitch.—Value is lower at about 65s. per ton f.o.b. Glasgow for export, and 62s. 6d. per ton *ex* works for home trade.

Refined tar.—Quotations are unchanged at 3¼d. to 3⅜d. per gallon f.o.r. in buyers' packages.

Creosote oil.—There are many inquiries, but supplies are short. B.E.S.A. Specification is 3¼d. to 3½d. per gallon; low gravity, 3½d. to 3¾d. per gallon; and neutral oil, 3¼d. to 3½d. per gallon; all in bulk *ex* works.

Cresylic acid.—Stocks are now comparatively low, and prices are steady. Pale, 97/99%, is 1s. to 1s. 1d. per gallon; dark, 97/99%, 10d. to 11d. per gallon; and pale, 99/100%, 1s. 3d. to 1s. 4d. per gallon—all f.o.r. in buyers' packages.

Crude naphtha is valued at 4½d. to 5d. per gallon *ex* works in bulk, according to quality and quantity.

Solvent naphtha.—90/160 grade is 1s. 6d. to 1s. 7d. per gallon, and 90/190 heavy naphtha 1s. per gallon.

Motor benzole.—The price is nominal at 1s. 7d. per gallon *ex* works.

Pyridines.—90/160 grade is 3s. 3d. to 3s. 6d. per gallon, and 90/140 grade 3s. 6d. to 3s. 9d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole . . .	0 10	to	0 10¼	per gallon at works
Motor " . . .	1 5	"	1 5½	" " "
Pure " . . .	1 8½	"	1 9	" " "

Contracts Advertised To-Day.

Gas Oil.

Bexhill Gas Department. [p. 668.]

Mansfield Gas Committee. [p. 668.]

Colonial Gas Association, Ltd.

The Directors of the Colonial Gas Association have submitted their forty-fifth annual report, which shows that after providing for depreciation, income-taxes, and the payment of loan and debenture interest, the net profit for the year ended June 30, 1933, is £68,082, to which must be added the balance of £22,698 brought forward from last year. Deducting the interim dividends of 4% and 3% paid in April last on the preference and ordinary shares respectively, and providing for exchange, the amount at credit of the net revenue account at June 30 is £54,183.

The Directors recommend:

(*a*) That a dividend at the rate of 8% per annum (less interim dividend of 4% for the half-year ended Dec. 31, 1932) be paid on the preference shares;

(*b*) That a dividend at the rate of 6% per annum (less interim dividend of 3% for the half-year ended Dec. 31, 1932) be paid on the ordinary shares; and

(*c*) That the balance (approximately £23,600) be carried forward to the next account.

The Association's works showed an increase of 2·8% in the amount of gas sold, while the subsidiary gas undertakings showed a decrease of 3·2% upon the sales of the preceding year.

The item "Exchange Suspense Account, £6020," in the net revenue account represents provision for the possibility of dividends to preference shareholders on the London Register, being held to be payable in sterling.

Corporation Undertakings' Results.

Dundee.

The quantity of gas made during the year ended May 15, 1933, amounted to 1,833,144,528 c.ft. of coal and carburetted water gas, compared with 1,832,650,407 c.ft. in 1931-32, an increase of 494,116 c.ft. The gas sold, inclusive of that used on works, amounted to 1,692,174,825 c.ft., compared with 1,677,889,400 c.ft., an increase of 14,285,425 c.ft. Gas unaccounted for amounted to 7·69% of the production, compared with 8·44% during the previous year. The Department has again had a very successful year and has further reduced working costs, thereby enabling a substantial reduction in the price of gas to be made. A surplus in the year's working of £10,342 has been carried to the reserve fund started last year with an annual contribution of £1500 and now amounts to £13,342. This fund should have a steadying influence on the price of gas in enabling the Department to meet heavy renewals of plant, &c., therefrom instead of out of the revenue of any one year. Capital expenditure of £772 was met out of the year's revenue, while a special contribution of £1672 was made to appliances depreciation fund, restoring the fund to an agreed maximum of £25,000.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

Issue. £	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. Nov. 25. (Provincial Exchanges Nov. 24.)	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week
1,551,868	Stk.	Oct 9	7	7	Alliance & Dublin Ord. ...	122—132	...	...
374,000	..	July 10	4	4	Do. 4 p.c. Deb. ...	85—95	...	...
557,655	..	Aug. 28	7	7	Barnet Ord. 7 p.c.	167—172	+2	169—169½
300,000	1	Oct. 23	1/9⅜	1/4⅜	Bombay, Ltd.	26/—28/-	...	27/7½
178,280	Stk.	Aug. 14	9½	9½	Bournemouth sliding scale	192—202	...	195
550,050	..	..	7	7	Do. 7 p.c. max. ...	163—168	...	164
439,160	..	..	6	6	Do. 6 p.c. Pref. ...	135—140	...	140
50,000	..	June 26	3	3	Do. 3 p.c. Deb. ...	75—80	...	...
162,025	..	..	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
210,000	..	..	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
357,900	..	Aug. 28	7½	7½	Brighton, &c. 6 p.c. Con. ...	160—170	...	165
540,000	..	..	6½	6½	Do. 5 p.c. Con. ...	145—150	+1	...
195,500	..	..	6	6	Do. 6 p.c. B Pref.	135—140	...	...
1,487,500	..	July 24	5	5	Bristol 5 p.c. max.	113 - 114*a*	...	...
120,420	..	June 26	4	4	Do. 1st 4 p.c. Deb. ...	99 - 101*a*	...	...
217,870	..	..	4	4	Do. 2nd 4 p.c. Deb. ...	99—100*a*	...	...
328,790	..	..	5	5	Do. 5 p.c. Deb.	121—123*a*	...	...
855,000	..	Sept 25	8	7	British Ord.	156—160	−4	155—159
100,000	..	June 26	7	7	Do. 7 p.c. Pref.	147—152	...	...
350,000	..	..	5½	5½	Do. 5½ p.c. Pref. ...	108—113	...	...
120,000	..	..	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...	...
450,000	..	..	5	5	Do. 5 p.c. Red. Deb. ...	108—113	...	...
160,000	..	June 26	5	5	Cambridge 5 p.c. Deb. ...	115—120	...	...
100,000	10	May 22	6	4	Cape Town, Ltd.	7—8	...	...
100,000	10	Nov. 6	4½	4½	Do. 4½ p.c. Pref. ...	6⅞—7⅞	...	...
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb. ...	95—100	...	...
626,860	..	July 24	6	6	Cardiff Con. Ord.	117—122	...	...
237,860	..	June 26	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	..	Aug. 14	6½	5	Chester 5 p.c. Ord.	105—110*b*	...	...
98,936	1	Oct. 9	2/-	2/-	Colombo, Ltd. Ord.... ...	1⅞—1⅞	...	...
24,500	1	..	1/4⅜	1/4⅜	Do. 7 p.c. Pref. ..	18/6—20/6	...	...
609,304	1	Oct. 9	/11 48	/11 48	Colonial Gas Assn. Ltd. Ord.	1⅛—1⅛	...	...
296,053	1	..	1/3·30	1/3·30	Do. 8 p.c. Pref.	23/—26/-	...	...
1,796,955	Stk.	July 24	6½	5	Commercial Ord.	122—127	...	123½—126
475,000	..	June 12	3	3	Do. 3 p.c. Deb. ...	75—80	...	...
265,272	..	Mar. 6	—	5	Do. 5 p.c. Deb. ...	120—125	...	125
307,560	..	Aug. 14	7	7	Croydon sliding scale ...	147—152	...	...
469,590	..	..	5	5	Do. max. div.	105—110	...	108—108½
500,000	..	July 10	5	5	Do. 5 p.c. Deb.	120—125	...	...
542,270	..	Mar. 6	7	10	Derby Con.	170—180*c*	...	...
55,000	..	July 10	4	4	Do. 4 p.c. Deb.	98—100*c*	+3½	...
209,000	..	Aug. 28	5	5	East Hull Ord. 5 p.c. ...	108—113	...	...
179,500	..	Aug. 28	6	6	East Surrey Ord. 5 p.c. ...	127—132	...	130—131
155,019	..	June 26	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
1,002,180	..	Sept. 25	17	15	European, Ltd.	120—130	...	120—122½
19,373,992	..	Aug. 14	5⅝	5⅝	Gas Light & Coke 4 p.c. Ord.	25/9—26/9/	−/9	25/10½—27/-
2,600,000	..	..	8½	8½	Do. 8½ p.c. max.	86—89	...	87—88
4,477,106	..	..	4	4	Do. 4 p.c. Con. Pref. ...	102—105	...	102½
6,102,497	..	June 12	8	8	Do. 8 p.c. Con. Deb. ...	82—85	...	82—83⅞
3,642,770	..	..	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	116—117
3,500,000	..	..	4½	4½	Do. 4½ p.c. Red. Deb. ...	112—116	...	112½—114
270,466	..	Aug. 28	6	6	Harrogate New Cons. ...	120—125	...	...
82,500	..	Aug. 28	7	7	Hastings & St. L. 5 p.c. Conv.	143—148	...	...
258,740	..	..	5½	5½	Do. 5½ p.c. Conv.	111—116	...	...
140,000	1	Oct. 9	110	1/7½	Hongkong & China, Ltd. ...	29/—32/-	−1/6	...
218,200	Stk.	Aug. 14	6	6	Hornsey Con. 3½ p.c. ...	120—125	...	126
5,600,000	..	Nov. 6	14	10	Imperial Continental Cap.	195—205	+2	197—200½
223,130	..	Aug. 14	3½	3½	Do. 3½ p.c. Red. Deb.	90—95	...	...
235,342	..	Aug. 14	8½	8½	Lea Bridge 5 p.c. Ord. ...	170—175	...	...
2,145,907	..	Aug. 14	6	6	Liverpool 5 p.c. Ord. ...	130—132*b*	...	...
245,500	..	June 26	5	5	Do. 5 p.c. Red. Pref. ...	103—113*b*	...	...
306,083	..	July 17	4	4	Do. 4 p.c. Deb. ...	99½—101½*b*	...	...
165,736	..	Aug. 28	10	8	Maidstone 5 p.c. Cap. ...	180—190	...	...
56,176	..	July 10	3	3	Do. 3 p.c. Deb. ...	69—74	...	...
75,000	5	June 12	110	110	Malta & Mediterranean ...	9—11	...	...
392,000	—	Oct. 2	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	...	...
231,978	Stk.	Aug. 28	5	5	M. S. Utility "C." Cons. ...	111—116	...	...
818,657	..	..	4	4	Do. 4 p.c. Cons. Pref.	92—97	...	...
112,126	..	June 26	4	4	Do. 4 p.c. Deb. ...	100—105	...	105
148,955	..	..	5	5	Do. 5 p.c. Deb. ...	118—118	...	...
675,000	..	21 May '31	16	16	Montevideo, Ltd.	60—70	...	60—61½
2,061,315	..	Aug. 14	5½	5	Newcastle & Gateshead Con.	25/6—26/3*d*	...	...
682,856	..	..	4	4	Do. 4 p.c. Pref. ...	101—103*d*	+1	...
776,706	..	July 10	3½	3½	Do. 3½ p.c. Deb. ...	92—94*d*	...	...
277,285	..	May 8	5	5	Do. 5 p.c. Deb. '43...	107—109*d*	...	...
274,000	..	Aug. 14	5	5	Newport (Mon.) 5 p.c. max.	101—104*a*	...	...
204,940	..	Aug. 28	7½	7½	North Middlesex 6 p.c. Con.	153—158	...	154
396,160	..	Aug. 14	5	5	Northampton 5 p.c. max. ...	101—106	...	...
300,000	..	Apl. 24	9	7	Oriental, Ltd.	132—137	...	...
316,617	..	June 26	8	8	Plym'th & Stonehouse 5 p.c.	167—172	...	169½
504,416	..	Aug. 28	8	8	Portsm'th Con. Stk. 4 p.c. Std.	162—167	...	...
241,446	..	..	5	5	Do. 5 p.c. max. ...	102—107	...	...
114,000	..	Aug. 14	5	5	Preston 5 p.c. Pref.	105—110	+4	108⅜
686,312	..	July 24	4	4	Primitiva 4 p.c. Rd. Db. 1911	84—93	...	...
389,813	..	June 26	4	4	Do. 4 p.c. Cons. Deb.	88—93	...	...
150,000	10	Sept 25	6	6	San Paulo 6 p.c. Pref. ...	6½—7½	...	...
1,736,968	Stk.	Sept. 11	6	6	Sheffield Cons.	134—136*e*	...	...
95,000	..	July 10	4	4	Do. 4 p.c. Deb.	90—94*e*	...	...
133,201	..	Sept 11	5	8½	Shrewsbury 5 p.c. Ord. ...	132—137	...	...
90,000	10	June 12	15	14	South African	3—5	...	...
6,709,895	Stk.	Aug. 14	7	5	South Met. Ord.	133—136	...	134—135½
1,135,812	..	..	6	6	Do. 6 p.c. Irred. Pf.	137—142	...	...
850,000	..	..	20/-*g*	4	Do. 4 p.c. Irred. Pf.	102—105	...	102½—103⅝
1,895,445	..	July 10	3	3	Do. 3 p.c. Deb. ...	80—83	...	83
1 000,000	..	July 24	5	5	Do. 5 p.c. Red. Deb.	112—116	...	113½
209,820	..	Aug. 14	8½	8½	South Shields Con.	172—174*d*	...	...
1,543,795	..	Aug. 14	6	6	South Suburban Ord. 5 p.c.	131—136	...	133—135
300,000	..	..	5	5	Do. 5 p.c. Pref.	113—118	...	115—116½
300,000	..	..	—	4	Do. 4 p.c. Pref.	100—103	...	...
868,837	..	June 26	5	5	Do. 5 p.c. Deb.	119—124	...	122½—125
100,000	..	..	—	—	Do. 4 p.c. Deb.	102—105	...	...
647,740	..	Aug. 28	5	5	Southampt'n Ord. 5 p.c. max.	107—112	...	...
121,275	..	June 26	4	4	Do. 4 p.c. Deb.	99—104	...	...
350,000	..	Aug. 28	5½	5½	Swansea 5½ p.c. Red. Pref.	107—111	...	109½—110
200,000	..	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	103—108	...	...
1,076,490	..	Aug. 14	6⅝	6⅝	Tottenham and District Ord.	148—153	...	153
300,000	..	..	5½	5½	Do. 5½ p.c. Pref. ...	124—129	...	...
62,235	..	..	5	5	Do. 5 p.c. Pref. ...	112—117	...	...
199,005	..	June 12	4	4	Do. 4 p.c. Deb. ...	98—103	...	...
85,701	..	Oct. 9	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	90—100	...	...
347,769	..	Aug. 28	7	7	Uxbridge, &c., 5 p.c. ...	144—149	...	...
88,330	..	..	5	5	Do. 5 p.c. Pref. ...	112—117	...	...
1,322,220	..	July 10	7	7	Wandsworth Consolidated	153—158	...	157—158
1,096,373	..	..	5	5	Do. 5 p.c. Pref.	118—123	+1	120—121
1,317,964	..	June 26	5	5	Do. 5 p.c. Deb.	120—125	+2	...
158,400	..	Aug. 28	6*h*	5	Winchester W. & G. 5p.c. Con.	115—120	...	...

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.* Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock *g.*—For quarter. *h.*—Paid £3, including 10s. on account of back dividends. *i.*—The interest due 1/7/33 was paid on that date. * Ex. div. † Paid free of income-tax. ‡ For year. Hongkong & China, Ltd.—paid on £10 shares.

PATENTS.

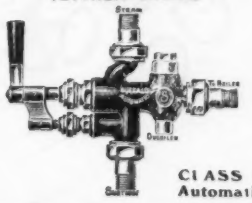
PATENTS for Inventions, Trade Marks "Advice Handbooks" and Consultations free. KING'S PATENT AGENCY LTD., Director B. T. KING, C.I.M.E., Regd. Patent Agent, G.B., U.S., and Can., 146A, QUEEN VICTORIA ST., E.C. 4, and 57, CHANCERY LANE (near Pat. Off.), LONDON, W.C. 2. 47 years' refs. 'Phone Cent. 0682.

MEWBURN, ELLIS, & CO.,
CHARTERED PATENT AGENTS AND
TRADE MARK AGENTS,
70 & 72, Chancery Lane, London, W.C. 2.
Telegrams: "Patent, London." 'Phone: 243 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

HEMP GRUMMETS
Millions Sold Ask for Samples
A. WITHINSHAW
HELLIER STREET, DUDLEY, WORC.

GASHOLDER
INDEPENDENT
INSPECTIONS
COMPREHENSIVE, UNBIASED REPORTS
25 Years' Experience
LEONARD BOTT, GRANVILLE VILLAS, NEWPORT, Shropshire

TROTTER HAINES, & CORBETT LIMITED
BRETTEL'S ESTATE
FIRE-CLAY & BRICK WORKS
STOURBRIDGE
Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST FURNACE BRICKS, LUMPS, TILES, and every Description of FIRE BRICKS.
Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.
SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.
LONDON OFFICE: E. C. BROWN & Co., LEADENHALL CHAMBERS, 4, ST. MARY AXE, E.C.

BUFFALO INJECTOR
(British Made)

CLASS B
Automatic
Operated entirely by one handle
GREEN & BOULDING, LTD.,
162a, DALSTON LANE, LONDON, E. 8.

CAST IRON
PIPES
FOR
GAS, WATER, & STEAM
1¼in. to 12in. BORE.
THOS. ALLAN & SONS, LTD.,
Bonlea Foundry,
THORNABY-ON-TEES.
Telegrams: "BONLEA, THORNABY-ON-TEES."
Telephone No.: STOCKTON 66121 (Two lines).

A&M GAS·METERS

TRAIN·THE·THERMS

THE·PARADE·OF·THE·THERMS

WORKING AT HIGH CAPACITY

Pick 'em up! Pick 'em up! Every beat of the swift moving feet is observed by Sergt. A. & M. Meters. At the "double" or at the "slow" march he checks their every movement. His critical eye is ever on the look-out and he never has a "missing" list. Whether his therms are producing light, heat or power, he supervises with a mechanical efficiency. Are A. & M. Meters looking after your therms yet?

ALDER & MACKAY LIMITED

MAKE METERS OF METICULOUS MEASUREMENT.

The
ALDER & MACKAY HIGH-CAPACITY METER

This meter is constructed with a higher "capacity per revolution" than the standard and is not, therefore, speeded up to give larger capacity per hour. Our 80 ft. size has a revolution capacity of 25 ft. and consequently performs 320 revs. per hour at maximum load. This meter is perfectly sound, reliable and most efficient. Complete details will be gladly sent on request. Send us your enquiries or consult us on your problems.

ALDER & MACKAY LTD., EDINBURGH, LONDON & BRANCHES.

THE GAS JOURNAL

DECEMBER 6, 1933

Vol. 204. 85th Year No. 3681

A Glance at the Contents—

Ammoniacal Liquor Problem at Oldham.

In a paper before the Manchester and District Junior Gas Association, Mr. N. Partington, B.Sc., A.I.C., discussed the ammoniacal liquor problem at Oldham. [p. 719.]

Technical Signpost to the "Journal."

Published to-day is our "Technical Signpost" to Vol. 203 of the "JOURNAL" covering items of outstanding technical interest during the July-September quarter of 1933. [p. 708.]

New Lamps for Old.

The utilization of waste light is one of the valuable functions claimed for Parkinson's "Mor-lite" reflectors; and double the candle power is said to be obtainable with their aid at that angle where the light can most usefully be applied. [p. 712.]

General Notification of the Gas Referees.

The General Notification of the Gas Referees was last revised for the re-issue which came into force on Oct. 1, 1930. A re-issue with extensive revision will come into force on Jan. 1 next, and the more important of the alterations embodied are summarized. [p. 711.]

Refractory Materials Section of the Ceramic Society.

The Autumn Meeting of the Refractory Materials Section of the Ceramic Society was held at Burlington House, London, when the programme maintained the usual high standard, and no fewer than ten papers were submitted We publish abstracts of three of these. [p. 706.]

A Scheme for Outdoor Selling.

Speaking to the Western Junior Gas Association Mr. E. A. Smith, of the Bath Gas Company, outlined an interesting scheme for outdoor selling, being his personal idea for procuring additional sales of appliances. [p. 718.]

Tars for Use on Roads.

The qualities of tars for use on roads formed the subject of a paper read by Mr. W. E. Cone, Technical Adviser to the British Road Tar Association, before the Public Works, Roads, and Transport Congress on Nov. 14. [p. 714.]

Yorkshire Junior Gas Association.

Members of this Association met at Brighouse on Nov. 18, when Mr. J. E. Wakeford, Assistant Engineer and Manager of the local Gas Undertaking, read a paper on the subject of "Modern Gas-Works Policy and Development." [p. 716.]

Dry Purification.

In a paper before the Public Works, Roads, and Transport Congress on Nov. 14, Mr. W. A. Currie, Jun., Technical Assistant to the Glasgow Corporation Gas Department, dealt with the subject of new methods of control of dry purification. [p. 721.]

Forthcoming Engagements

Dec. 6.—I.G.E.—Meeting of 'Refractory Materials Sub-Committee, 2.30 p.m.

Dec. 8.—LONDON AND SOUTHERN JUNIOR ASSOCIATION.—Meeting. Paper by Mr. H. J. Risby.

Dec. 9.—SCOTTISH WESTERN JUNIOR ASSOCIATION.—Meeting. Paper by Mr. A. Bujnowski.

Dec. 11.—I.G.E.—Meetings of Finance Sub-Committee, 2 p.m.; Membership Sub-Committee, 2 p.m.; General Purposes Committee, 3 p.m.; Benevolent Fund Committee of Management, 4.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 12.—I.G.E.—Meetings of Council, 10 a.m.; Gas Education Executive Committee, 4 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 13.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, S.W. 1, at 2.30 p.m.

Dec. 14.—I.G.E.—Meeting of Liquor Effluents and Ammonia Sub-Committee, 2.30 p.m.

Dec. 14.—S.B.G.I.—Meeting of Council, 56, Victoria Street, S.W. 1, 2.30 p.m.

Dec. 14.—SOUTHERN ASSOCIATION (WESTERN SECTION).—Commercial Meeting at Rougemont Hotel, Exeter, 2.30 p.m.

Dec. 15.—I.G.E.—Meeting of Joint Research Committee, 10.30 a.m.

Dec. 16.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting at Huddersfield. Presidential Address.

Dec. 16.—WALES AND MONMOUTHSHIRE JUNIOR ASSOCIATION.—Meeting at Cardiff. Paper on "Modern Methods of Manufacturing Malleable Iron Pipe Fittings," by Mr. C. E. Green.

Dec. 20.—B.C.G.A.—Meeting of Executive Committee, 28, Grosvenor Gardens, S.W. 1, 12 noon.

Dec. 21.—I.G.E.—Meeting of Refractory Materials Joint Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Jan. 5, 1934.—I.G.E.—Meeting of Meters Committee, 2.30 p.m.

ROBERT DEMPSTER & SONS, Ltd., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS, GASHOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. Telegrams: "DEMPSTER, ELLAND." Telephone: ELLAND 261 (Private Branch Exchange).

FIRTH BLAKELEY, SONS, & CO., LTD.,
Vulcan Ironworks, Church Fenton, Yorks.,

MANUFACTURERS of Gasholders, Tanks, Condensers, Purifiers, Scrubbers, Washers, and every description of Gas Plant.
Telegrams: "BLAKELEYS, CHURCH FENTON." Telephone: HARKSTON ASH 34 (Private Branch Exchange). Code: "BENTLEYS."

STEAM ENGINES FOR **GAS WORKS**

ASHWORTH & PARKER,
Riverside Works, Bury, Lancs.
(See illustrated advertisement Nov. 22, p. 558.)

THOMAS DUXBURY AND CO.
16, DEANSGATE, MANCHESTER, 3. PALACE CHAMBERS, WESTMINSTER, S.W.1.
FOR
LUX
GAS PURIFYING MATERIAL.

Immediate delivery from STOCKS at:—
Grangemouth, Middlesbrough, Goole, London, Poole, Newport and Garston.

Quotations given for forward delivery.

SPENT BOUGHT.

Telephones	*Telegrams:*
Manchester: Blackfriars 2268.	Darwinian, Manchester.
London: Whitehall 6501.	Darwinian Parl, London.

GEORGE WILSON GAS METERS, Ltd.
for
GAS-METERS, ORDINARIES, SLOTS, AND REPAIRS
Foleshill Road, COVENTRY.
'Phone: 3655 Coventry. Grams: "GASMETER."
Certus Works, Kingston Road, Raynes Park, LONDON, S.W.20.
Radium Works, 11, Radium Street, Oldham Road, MANCHESTER.
(See advertisement Nov. 15, p. 462.)

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.,
99, LONDON ROAD, LEICESTER.
Telegrams: "BRIPURIMAT, LEICESTER." Telephone: LEICESTER 59086.

NATURAL BRITISH PURIFYING MATERIAL

"A" QUALITY for normal requirements.

"VYLSEL" for exacting conditions such as exposed purifiers or limited purifier capacity.

Constant moisture 28% summer and winter.

Also **"FIRST-QUALITY" DUTCH BOG ORE.**

Spent oxide purchased.

PUBLIC APPOINTMENTS.

SOUTH METROPOLITAN GAS COMPANY.

OWING to the regretted death of Mr. Frank Day, the position of Secretary is now vacant, and applications are invited for the post. The terms and conditions of the appointment are set out on the form of application to be obtained from the undersigned.

A. S. HOLDEN,
Assistant Secretary.

709, Old Kent Road,
London, S.E. 15.

APPOINTMENTS, &c., VACANT.

APPLICANTS for the Position of FITTERS to the Bideford Gas and Coke Company, Ltd., are THANKED, and informed that SELECTION HAS BEEN MADE.

APPLICATIONS are invited for the position of ACCOUNTANT to a Progressive Gas Undertaking in the North.

Candidates must be qualified Chartered or Incorporated Accountants, and will be required to exercise Complete Control of the Accounting System of the Undertaking, and must have had Experience in the Control and Supervision of Staffs. Strong personality with administrative and disciplinary attributes essential. Salary, £500 per Annum.

Applications, with recent Testimonials or References, to be sent in not later than 4th December, 1933, addressed No. 8369, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

GAS METERS.

WELL-KNOWN Firm of Gas Meter Manufacturers require competent WORKS MANAGER. Applicants must have thorough technical knowledge of latest developments, and be capable of Designing Meters and Organizing their Production on Modern Lines.

Applications will be treated in strict confidence, and should state Age, Salary required, and full Technical and Practical Qualifications.

Address, No. 8370, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

REPRESENTATIVE Wanted, having good Connection in the Gas Industry, by well-known Firm of Engineering Specialty Manufacturers.

State ground covered, and full particulars, in confidence, to No. 8371, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

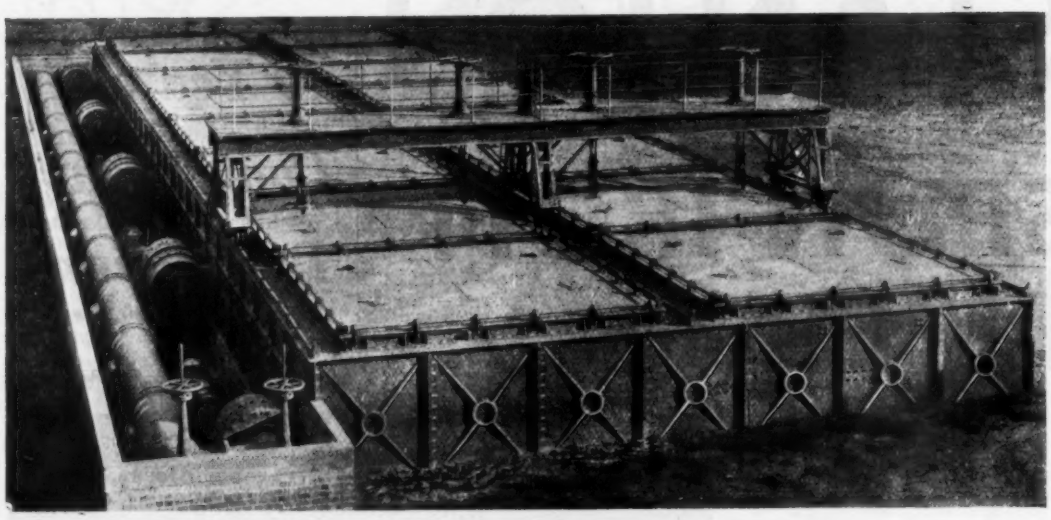
WANTED — Competent Inspector. Experienced Control of Mains, Services, Fittings generally, Repairs, and Maintenance all Gas Appliances.

Apply, stating Age and Experience, to The MANAGING-DIRECTOR, SALISBURY GAS COMPANY.

(Continuation of small adverts. on p. 668.)

C. & W. WALKER, LTD.

DONNINGTON, Nr. WELLINGTON—SHROPSHIRE.



FOUR PURIFIERS, EACH 35 FEET SQUARE, ERECTED AT STAFFORD.

COMPLETE PURIFIER INSTALLATIONS
ON GROUND OR OVERHEAD
WITH
MILBOURNE VALVES, FASTENERS & DISCHARGE SHOOTS, AND MILBOURNE-BEARD RUBBER JOINTING.

LONDON OFFICE: 70, VICTORIA STREET, WESTMINSTER, S.W. 1.

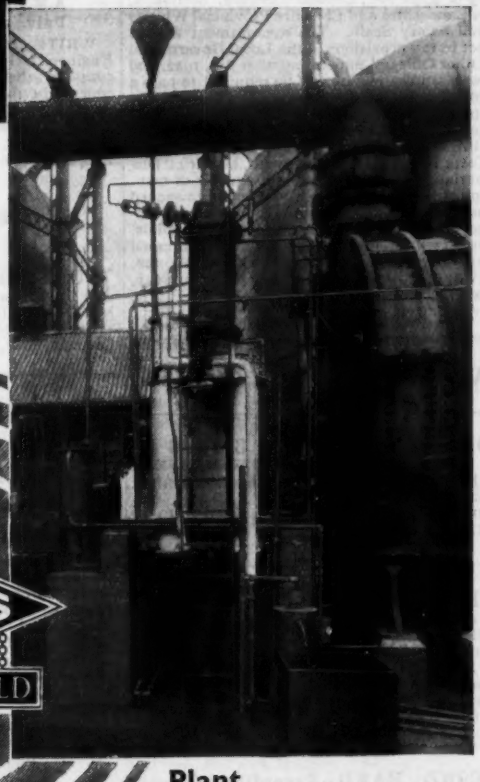
We are exhibiting at the B.I.F., BIRMINGHAM, STAND No. 12A/3, Gas Section.

NEW SYSTEM OF BENZOLE RECOVERY

PATENT NO. 393,041

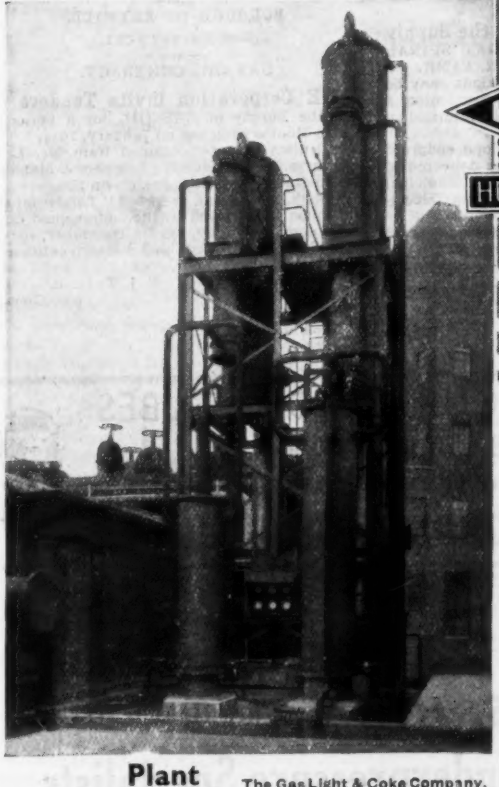
ORIGINAL FEATURES.

1. Single circulation of wash oil with one pump.
2. Improved system of heating.
3. Patented system of automatic control.



HOLMES
FOUNDED 1850
HUDDERSFIELD

Plant No. 1. Huddersfield Corporation Gas Department, installed January, 1931.



Plant No. 46. The Gas Light & Coke Company, London, Bow Common Station, installed March, 1933.

RESULTS WHICH FOLLOW

from the adoption of this design.

1. Maximum efficiency.
2. High thermal efficiency.
3. Simplicity of operation and control.

76 INSTALLATIONS SINCE 1930

W. C. HOLMES & CO. LTD.

ENGINEERS

Telegrams:
Holmes, Huddersfield.

Telephone:
1573 Private Branch Exchange.

Specialists in the Design and Manufacture of Plant for the recovery and refining of Coal By-Products and the treatment of Fuel-Gases.

London Office:
119, Victoria Street, Westminster, S.W.1.

Telegrams:
Ignitor, Sowest.

Telephone:
Victoria 4505.

HUDDERSFIELD

101

APPOINTMENTS, &c., VACANT.
(Continued.)

COUNTY BOROUGH OF STOCKPORT.
(GAS DEPARTMENT.)

PUBLIC LIGHTING INSPECTOR.

APPLICATIONS are invited for the Position of INSPECTOR in the PUBLIC LIGHTING DEPARTMENT, at a commencing Salary of £192 10s., Clerical Division, Section A, of the Lancashire and Cheshire Provincial Whitley Council Salary Scale. The appointment will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1922, and the successful candidate will be required to pass a Medical Examination.

Applicants must have had a thorough Training in the Operation and Maintenance of High and Low Pressure Gas Lighting, and be able to Carry out Tests in connection therewith, be Strict Disciplinarian, and able to Control a number of men.

Applications, stating Age, which is not to exceed 45 years, Qualifications, and Experience, accompanied by *copies* of Three recent Testimonials, and endorsed "Lamp Inspector," to be addressed to the GAS ENGINEER AND MANAGER, GAS-WORKS, PORTWOOD, STOCKPORT, not later than Tuesday, the 12th December.

Nov. 21, 1933.

PLANT &c., FOR SALE & WANTED.

FOR SALE—2000 feet 3 ft. 6 in. diameter RIVETTED FLANGED PIPE in 25 ft. lengths, made of ⅜ in. Plate, in new condition. Price on application.

MIDLAND IRON & HARDWARE CO., CRADLEY HEATH.

CORNISH Boiler, 20 ft. by 6 ft. dia- meter. Makers, Daniel Adamson, 1915. Complete Fittings (handfired). Reinsured 160 lbs. working pressure. Condition as New. Price £160 loaded. Delivery and fixing anywhere, if required.

RATCLIFFE, "BOILER-EXCHANGE," HAWARDEN, CHESTER.

SECOND-HAND Recording Calori- METER Wanted. 24-Hour or Eight-Day, by good Maker.

BOULTON & PAUL, LTD., NORWICH.

EDUCATIONAL.

HOW TO BECOME A QUALIFIED GAS ENGINEER

THE T.I.G.B., the premier establish- ment for engineering training by correspondence, will train you until successful for:

Certificates of the Institution of Gas Engineers, A.M.Inst.C.E., A.M.I.Mech.E., A.M.I.E.E., C. & G., B.Sc. (Eng.) Lond. Univ., etc.

WRITE TO-DAY for FREE copy of "The Engineer's Guide to Success," 144 pages, which contains the widest selection of engineering courses in the world, and gives full information about the professional examinations open to you.

THE TECHNOLOGICAL INSTITUTE OF GREAT BRITAIN, 148, TEMPLE BAR HOUSE, LONDON, E.C. 4. (Founded 1917. 19,000 Successes.)

JOURNALS FOR SALE.

FOR SALE – Back Nos. "Gas Journal," June, 1926, to Dec., 1929, complete, and Jan., 1930, to Dec., 1931, almost complete.

PATENT RETORTS, LTD., 5, VICTORIA STREET, LONDON, S.W. 1.

CONTRACTS OPEN.

COUNTY BOROUGH OF MIDDLESBROUGH.
(GAS DEPARTMENT.)

TENDERS are invited for the Supply and Erection of a FOUR-LIFT SPIRAL GUIDED GASHOLDER and STEEL TANK.

Specification and General Conditions may be obtained from the undersigned on payment of a deposit of Two Guineas, which will be returned on receipt of a *bona-fide* Tender.

Tenders to be sent in sealed envelope, endorsed "Tender for Gasholder," and to be delivered to Preston Kitchen, Esq., Town Clerk, Municipal Buildings, Middlesbrough, not later than December 20th.

The Committee do not bind themselves to accept the lowest or any Tender.

(Signed) CHARLES F. BLINCOE,
Engineer and Manager.

Gas-Works,
Commercial Street,
Middlesbrough.

COUNTY BOROUGH OF MIDDLESBROUGH.
(GAS DEPARTMENT.)

TENDERS are invited for the Con- struction of a REINFORCED RAFT and PILE FOUNDATION for a Gasholder, to be erected on a site adjacent to Cannon Street.

Drawing, Specification, and General Conditions may be obtained f om the undersigned on payment of Two Pounds, which will be returned on receipt of a *bona-fide* Tender.

Tenders to be sent in a sealed envelope, endorsed "Tender for Gasholder Foundation," and to be delivered to Preston Kitchen, Esq., Town Clerk, Municipal Buildings, Middlesbrough, not later than December 20th.

The Committee do not bind themselves to accept the lowest or any Tender.

(Signed) CHARLES F. BLINCOE,
Engineer and Manager.

Gas-Works,
Commercial Street,
Middlesbrough.

BOROUGH OF MANSFIELD.

TENDERS FOR GAS OIL.

THE Gas Committee of the Mansfield Corporation invite TENDERS for the Supply of 350 Tons of GAS OIL from the 1st January to 31st December, 1934.

Particulars of the Oil quoted for should be given.

Tenders, sealed, and endorsed "Tenders for Gas Oil," to be delivered to the undersigned on or before Saturday, 9th December, 1933.

The Corporation do not bind themselves to accept the lowest or any Tender.

A. C. SHEPHERD,
Town Clerk.

Carr Bank,
Mansfield,
Nov. 24, 1933.

BOROUGH OF BEXHILL.
(GAS DEPARTMENT.)

GAS OIL CONTRACT.

THE Corporation invite Tenders for the Supply of GAS OIL for a period of Twelve Months from the 1st January, 1934.

Particulars may be obtained from Mr. L. G. Humphrys, A.M.I.Mech.E., Engineer & Manager, Gas Offices, 5, Sea Road, Bexhill-on-Sea.

Tenders, sealed, and endorsed "Tender for Gas Oil," must be received by the undersigned on or before noon on Friday, the 8th December, 1933.

The Corporation do not bind themselves to accept the lowest or any Tender.

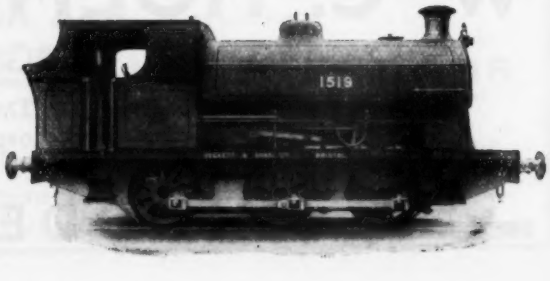
S. J. TAYLOR,
Town Clerk.

Town Hall,
Bexhill-on-Sea,
Nov. 22, 1933.

INSULATING BRICKS — RECUPERATOR TUBES
Special semi silica quality for Segmental Retorts
with no Expansion or Contraction at 1400° C.
HARRIS & PEARSON, LTD., STOURBRIDGE, ENGLAND

JOHN RUSCOE & Co., LTD.
ESTABLISHED 1865. ALBION WORKS, HYDE, Nr. MANCHESTER.
Gas Engineers & Tool Makers. Underpressure Specialists.
London Offices: 48/50, ALDERSGATE STREET, LONDON, E.C. 1.

LOCOMOTIVES
LOCOMOTIVES of all Sizes and Gauges specially constructed for Main and Branch Lines, Contractors, Docks, Gas-Works, Collieries, Iron-Works, Brick and Cement Works, &c. Locomotives of various Sizes always in progress for early delivery.
Photographs, Specifications, and Prices on Application.
PECKETT & SONS, Atlas Locomotive Works, LTD., BRISTOL.
Telegraphic Address: "PECKETT BRISTOL."
London Representatives: FERGUSON & PALMER, 9, Victoria St., Westminster, S.W. 1



INDEX TO "JOURNAL" ADVERTISERS.

A

	PAGE
Abbott, Birks, & Co.	—
Aerograph Co., Ltd.	—
Alder & Mackay, Ltd.	Wrapper I., 664
Allan, Thomas, & Sons, Ltd.	663
Anglo-American Oil Company, Ltd.	—
Arden Hill & Co.	—
Ashmore, Benson, Pease, & Co., Ltd.	Wrapper I.
Ashworth & Parker	666
Astrah Products	—
Automatic Light Controlling Co., Ltd.	624

B

Bale & Church, Ltd.	665
Barclay, Andrew, Sons, & Co., Ltd.	626
Barrowfield Ironworks, Ltd.	—
Bates, J., & Sons	—
Blakeley Firth, Sons, & Co., Ltd.	666
Bott, Leonard	663
Braddock, J. & J.	Centre IX., 665
Bratt Colbran & Co.	627
Bray, George, & Co., Ltd.	621
British Aluminium Co., Ltd.	—
Bremner Patents (Holding Co.), Ltd.	—
British Furnaces, Ltd.	—
British Gas Purifying Materials Co.	666
British Steam Specialties, Ltd.	—
British Thomson-Houston Co., Ltd.	630
Broadbent, Thos., & Son, Ltd.	—
Broadhead Constructions, Ltd.	—
Brockhouse, J., & Co., Ltd.	—
Bugden, T., & Co.	—

C

C.C. Fire	—
Cambridge Instrument Co., Ltd.	633
Cannon Iron Foundries, Ltd.	—
Carron Company	—
Cellactite & British Uralite, Ltd.	628
Chemical Engineering and Wilton's Patent Furnace Co., Ltd.	618
Clapham Bros., Ltd.	—
Clayton, Son, & Co., Ltd.	628
Cochranes (Middlesbro') Foundry, Ltd.	—
Cookers & Geysers, Ltd.	—
Cort, Robert, & Son, Ltd.	—
Cowan, W. & B.	Wrapper III.
Crone & Taylor, Ltd.	—
Cutler, Samuel, & Sons, Ltd.	660

D

Davis Gas Stove Co., Ltd.	629
Dempster, R. & J., Ltd.	Wrapper I.
Dempster, R., & Sons, Ltd.	Centre II., 666
Denison, Saml., & Son, Ltd.	—
Diaphragm & General Leather Co., Ltd.	—
Donkin Co., Ltd. (The Bryan)	Wrapper II.
Dougall's Gas Meters, Ltd.	—
Drakes, Ltd.	—
Drayton Regulator and Instrument Co., Ltd.	—
Dry Gasholders, Ltd.	—
Duxbury, Thomas, & Co.	Wrapper I., 666

E

E. B. Refractory Cement Co., Ltd.	—
Economic Gas Boiler Co., Ltd.	—
Electric Construction Co., Ltd.	—
Electrolux, Ltd.	—
Enamelled Iron and Steel Products Co.	—
Evans, Joseph, & Son (Wolverhampton), Ltd.	670
Expanded Metal Company, Ltd.	—

F

F. C. Construction Co., Ltd.	—
Falk, Stadelmann, & Co., Ltd.	—
Flavel, S., & Co., Ltd.	619
Fletcher, Russell, & Co., Ltd.	—
Foster & Pullen, Ltd.	—
"Four Oaks" Spraying Machine Co.	—
Fraser & Chalmers Engineering Works	—

G

Gas Chambers and Coke Ovens, Ltd.	—
Gas Meter Co., Ltd.	Wrapper IV., 616
Gas Purification and Chemical Co.	Wrapper I., 665
General Gas Appliances, Ltd.	Centre IX.
Gibbons Bros., Ltd.	—
Gibbons (Dudley), Ltd.	622
Gledhill-Brook Time Recorders	—
Glenboig Union Fireclay Co., Ltd.	620
Glover, George, & Co., Ltd.	613
Glover, Thos., & Co., Ltd.	634
Goodall, Clayton, & Co., Ltd.	631
Grant, David, & Co.	618
Graphite Products, Ltd.	—
Green & Boulding, Ltd.	663
Griffiths Bros. & Co. (London), Ltd.	Wrapper I.

H

Harper, John, & Co., Ltd.	617
Harris & Pearson, Ltd.	668
Haughton's Patent Metallic Packing Co., Ltd.	624
Head, Wrightson, & Co., Ltd.	—
Holmes, W. C., & Co., Ltd.	Wrapper I., 667
Horseley Bridge and Engineering Company, Ltd.	—
Horstmann Gear Company, Ltd.	—
Humphreys & Glasgow, Ltd.	632
Huntington Heberlein & Co., Ltd.	—
Hurry Water Heater Co.	—
Hutchinson Bros., Ltd.	—

I

Institute of Chemistry	—

J

Jenkins, W. J., & Co., Ltd.	—

K

Keith, James, & Blackman Company, Ltd.	670
Kempton, C. H., & Co., Ltd.	—
King, Walter, Ltd.	631
King's Patent Agency	663
Kirkham, Hulett, & Chandler, Ltd.	—
Kleenoff Co.	665

L

Laidlaw, R., & Son (Edin.), Ltd.	626
Lead Wool Company, Ltd.	—
Le Bas Tube Co., Ltd.	614
Lighting Trades Ltd.	—
Lomas, S. H., & Co.	—
London Electric Firm, The	—

M

Macpherson, Donald, & Co., Ltd.	—
Main, R. & A., Ltd.	Centre VII.
Manchester Oxide Co., Ltd.	—
McKelvie, James, & Co.	Wrapper I.
Mewburn, Ellis, & Co.	663
Mitchell, H., & Co.	—
Morris Commercial Cars Ltd.	—

N

National Benzole Co., Ltd.	623
National Enamels, Ltd.	615
New Conveyor Co., Ltd.	—
Newton Chambers & Co., Ltd.	Centre VI.
Nobel Chemical Finishes, Ltd.	—

O

Orme, George, & Co.	—
Oughtibridge Silica Firebrick Co.	614

P

Parkinson Stove Co., Ltd.	Centre III.
Parkinson, W., & Co.	620, 634
Pass, E., & Co.	—
Patent Retorts, Ltd.	—
Peckett & Sons, Ltd.	668
Peebles & Co., Ltd.	—
Pegson, Ltd.	—
Pifco, Ltd.	630
Piggott, Thos., & Co., Ltd.	—
Potterton, T. (Heating Engineers), Ltd.	—
Powers-Samas Accounting Machines, Ltd.	—
Pulsometer Engineering Co., Ltd.	Wrapper IV.
Purimachos Ltd.	630

R

Radiation Ltd.	Centre IV., V., 629
Reavell & Co., Ltd.	614
Richmonds Gas Stove Co., Ltd.	—
Robinson, J. H., & Co. (L'pool), Ltd.	—
Ross, Chas., Ltd.	665
Rotary Meter Company, Ltd.	—
Rotherham & Sons, Ltd.	—
Ruscoe, John, & Co., Ltd.	668

S

Sawer & Purves	661
Scottish Tube Co., Ltd.	616
Sheepbridge Coal and Iron Co., Ltd.	Wrapper IV.
Siebe, Gorman, & Co., Ltd.	670
Simon-Carves, Ltd.	—
Sisson, W., & Co., Ltd.	—
Smith Meters, Ltd.	—
South Metropolitan Gas Company	Wrapper II.
Spencer-Bonecourt, Ltd.	—
Sperryn & Co.	—
Stanton Ironworks Co., Ltd.	665
Staveley Coal and Iron Co., Ltd.	—
Stein, J. G., & Co., Ltd.	Wrapper I.
Stewarts and Lloyds, Ltd.	—
Strachan & Henshaw, Ltd.	613
Stringer Bros.	—
Sugg, Wm., & Co., Ltd.	—
Sutherland Meter Co., Ltd.	Centre VIII.

T

Thompson, J. (Wolverhampton), Ltd.	626
Tilley Bros., Ltd.	—
Torbay Paint Company	Wrapper I.
Trier Bros., Ltd.	—
Trotter, Haines, and Corbett, Ltd.	663
Tully Sons & Co., Ltd.	630
Turner, F. (Art Metal), Ltd.	621
Turners Asbestos Cement Co.	—

V

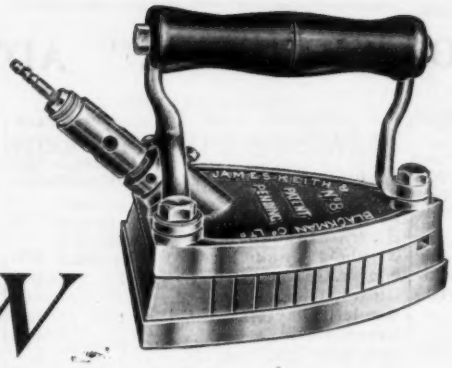
Vale, Thos., & Co., Ltd.	624
Valor Co., Ltd.	—
Vertical Gas Retort Synd., Ltd.	—
Vickers-Armstrongs, Ltd.	—
Visco Engineering Company, Ltd.	—
Vulcan Stove Co., Ltd.	—

W

Wakelin, F. H., Ltd.	—
Walker, C. & W., Ltd.	666
Walker, Crosweller, & Co., Ltd.	Wrapper IV.
Waller, Geo., & Son, Ltd.	—
Waterless Gasholder Co., Ltd.	—
Wellington Tube Works, Ltd.	—
Welsbach Light Company, Ltd.	—
West's Gas Improvement Co.	Centre X.
Westwood & Wrights, Ltd.	—
Whessoe Foundry and Eng. Co., Ltd.	—
Wholesale Fittings Co., Ltd.	618
Willey & Co., Ltd.	—
Williamson Cliff, Ltd.	—
Wilson (George) Gas Meters, Ltd.	666
Wilsons & Mathiesons, Ltd.	—
Windsor, H., & Co., Ltd.	625
Withinshaw, A.	663
Woodall-Duckham Co., Ltd.	Centre I.
Wright, Alex., & Co., Ltd.	Wrapper I
Wright, John, & Co.	—

Appointments Vacant and Wanted	666, 668
Company Notices	—
Contracts Open	668
Educational	668
"Journals" for Sale	668
Patents	663
Plant, &c., for Sale	668
Public Appointments	666
Publications	—
Stocks and Shares	—
Tarpaulins	—

ADVERTISEMENT INDEX



The *NEW*

Keith-Blackman

High-pressure Gas Laundry Iron

This new iron is the result of lengthy experience with high-pressure gas irons, and it has certain novel and patented features.

Gives even distribution of heat due to the burner being formed in the sole of the iron itself.

Does not "whistle."

Works smoothly.

Gives no trouble.

Makes ironing easier and increases output of work.

Simple to operate.

Fool-proof.

Its heat is adjustable to suit class of work in hand.

It does not smell.

It does not soot up or choke up with fibrous dust.

It is made in 4 sizes:—6, 8, 10, and 12 lbs. weight. The most popular size, the 8 lb., costs only about ¼d. an hour to run.

Write for full particulars and prices

'PHONES: CENTRAL 7091. 'GRAMS: JAMES KEITH, PHONE, LONDON.

James **KEITH & BLACKMAN** Co. Ltd.

HEAD OFFICE: 27 FARRINGDON AVENUE, LONDON, E.C.4.

We make Gas Equipment for almost every Industrial Heat Process.

Potential buyers in the Gas Industry can be reached more surely and economically through the "GAS JOURNAL" than by any other means.

"Everything for Safety Everywhere."

SMOKE HELMETS. GAS MASKS.
BREATHING APPARATUS OF ALL PATTERNS.
OXYGEN RESUSCITATING APPARATUS.
FIRE EXTINGUISHERS. FIRST-AID OUTFITS.
SAFETY AND PROTECTIVE APPLIANCES OF ALL DESCRIPTIONS.

SIEBE, GORMAN & CO. LTD.,
WESTMINSTER BRIDGE ROAD, LONDON, S.E.1.
Telegrams: "Siebe, Lamb, London" Telephone No.: HOP 3401 (2 lines)

JOSEPH EVANS & SONS, CULWELL WORKS,
(WOLVERHAMPTON) LTD. **WOLVERHAMPTON.**

PUMPS

Telegrams:
"EVANS, WOLVERHAMPTON."
National Telephone Nos.:
20864 and 20865.

London Address:
109, KINGSWAY, W.C.2.
Telegrams: "Dryosbo Westcent, London."
Telephone Holborn 1091.

PLEASE APPLY FOR CATALOGUE No. 8.

FIG. 105

FIG. 256

FIG. 257

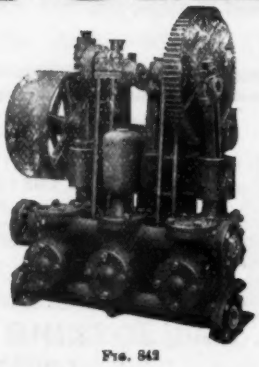


FIG. 842

FIG. 187

FIG. 69

FIG. 994

Printed (at the Chancery Lane Printing Works, Ltd.), for WALTER KING, LTD., 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.—Wednesday, November 29, 1933.